

Effects of COVID-19 on musculoskeletal system

Nasir Sultan ¹, Kiran Khushnood ², Malik Muhammad Ali Awan ³

¹ Senior Lecturer, Department of Rehabilitation Sciences, Shifa Tameer-e-Millat University, Islamabad, Pakistan

² Assistant Professor, Neuro Rehab, ISRA University, Islamabad, Pakistan

³ Assistant Professor, ISRA University, Islamabad, Pakistan

Author's Contribution

¹ Concept, design & accountable for all the work

² Drafting, revision & accountable for all the work

³ Critical analysis, final approval & accountable for all the work

Article Info.

Conflict of interest: Nil

Funding Sources: Nil

Correspondence

Malik Muhammad Ali Awan

mmaawan@gmail.com

Cite this article as: Sultan N, Khushnood K, and Awan A. Effects of COVID-19 on musculoskeletal system. JSTMU. 2020; 3(2):134-135.

Severe acute respiratory syndrome corona virus (SARS-CoV-2), also known as CoVID-19 has induced tremendous damage worldwide causing threat to the existence of human race. It primarily involves the respiratory system, compromises immune system, and exacerbates co – morbidities which ultimately leads to multiple system failure and death. Patients with deteriorated condition have to get hospitalized and the ones with mild symptoms need to self-quarantine themselves at home. Everyone has to be home bounded and opt for social distancing protocols, which has led to a huge change in lifestyle and mobility of people globally.¹

In order to stay healthy, physical activity is necessary. Human body constantly sense the internal environment and responds accordingly. Contracting muscles during exercise need excessive amount of energy that challenges body's homeostasis and leads to multiple responses by body organs. Muscle activation can raise the metabolic demands up to 100 times as compared to the resting state. In order to meet the rising energy demands certain adaptations take place in the body that may lead to long term changes as a result of physical activity. These adaptive changes involve every contractile

unit i.e. sarcomere. On the contrary, Immobilization and decline in physical activity will hamper the overall structure of skeletal muscles, causing muscle wasting thereby declining the overall strength in the human body.²

Researchers found that CoVID-19 causes weight loss and anorexia. The receptor for this virus is angiotensin converting enzyme 2 (ACE 2), which is found on skeletal muscles, so the one who is infected may have myalgia and weakness; and if combined with immobilization, bed rest or ventilator support it can lead to sarcopenia and cachexia.³

As literature shows that musculoskeletal dysfunction is one of the main consequences of CoVID-19. Sarcopenia is reduction in muscle function along with the loss of muscle fibers. Aging leads to primary sarcopenia, whereas sarcopenia due to underlying medical conditions is known as secondary sarcopenia, these underlying conditions could be chronic or acute. People affected with SARS-CoV-2 are likely to develop secondary sarcopenia due to several weeks of decreased physical activity and reduced functioning. Lung damage caused by CoVID-19 leads to hypoxemia that eventually results in decreased oxygen supply throughout the body including the muscle fibers and add up to destruction that is already being caused by the disease. Presence of ACE 2 receptor on muscles is the reason for causing these effects.³ after recovery, the patients who were critically ill and needed mechanical ventilation, reported with secondary complications such as weakness in the muscles and frailness of the bones. The other complication is cachexia; which is "complex metabolic syndrome associated with underlying illness causing muscle loss." Weight loss, anorexia, low albumin, inflammation and muscle protein breakdown are main features of cachexia.^{3,4} Sarcopenia and cachexia are one of the main contributors to morbidity and mortality. People with sarcopenia may need

exercises prescribed by a physical therapist and nutritional supplements throughout their lives, while the survivors of cachexia often need extensive rehabilitation management.⁵

Provision of routine exercise plans to every individual, especially to the ones who are isolated, is the dire need of today. It has been found evident that exercises and physical activity improves the outcomes in the hospitalized patients by reducing the damage caused to musculoskeletal system, by CoVID-19. In order to acquire and improve the agility, strength and flexibility of musculoskeletal system, regular planned physical exercise regimes should also be opted by the patients who are in recovery phase.

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