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Editorial

Covid 19 and Orthopedic Manifestations - A Quick Primer

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Coronavirus -2019-Covid 19 pandemic as declared by the world health organization in April 2020 and has caused widespread damage across nations which is reminiscent of the Spanish flu. United States leads the tally with more than 8 million patients affected by the disease and closely followed by India which is touching at about 5 million cases [1].

The disease has varied presentation and manifestation of the disease is categorized as mild, moderate or severe [2,3]. Usually the mild manifestation patients comprise 85% of the cases and they usually self-quarantine themselves and do not come to the hospital. The usual symptomatology in such patients is fever, shortness of breath, gastrointestinal distress, malaise, headache and ageusia and anosmia. The remaining 15% with moderate and severe symptoms end up seeking hospital care and may end up needing ventilation support [3].

Severe acute respiratory syndrome coronavirus 2(SARS-Cov-2) is a coronavirus /single-stranded RNA virus [4]. During this pandemic seven different strains of the Corona have been identified. Out of these seven strains SARS Cov 1 and 2 are responsible for causing the severe disease [5,6]. Both the strains gain foothold in the human body by the nasal pharynx/oral pharynx and in these locations they attach to the angiotensin converting enzyme -2 receptors [5-7] which are present on the mucosa of the above. It subsequently enters the cell and multiplies and then rapidly spreads in the body. While it replicates in the cell it is capable of disrupting variety of functions like nuclear transport, cytoskeleton stability, mitochondrion respiration and inflammatory signaling [8]. The affected cells eventually undergo apoptosis which also induces inflammation.

The initial havoc was played on the respiratory system in the treatment of the disease it has been observed over a period that the musculoskeletal system is involved as well [9-11]. The proposed etiologies for the musculoskeletal manifestations include direct involvement of the musculoskeletal system, a pro inflammatory condition which originate secondary to the lung infection and thereby leading to muscle and bone involvement.

It has been postulated that lung infection leads to release of cytokines like CXCL 10(Chemokine), interferon gamma alpha, interleukin one beta, Interleukins 6,17 and 18 and tumor necrosis factor which are responsible for the musculoskeletal manifestations [12,13]. Patients who are on ventilator for longer durations, the above mediators are elevated in that situation leading to profound musculoskeletal manifestations [12,13].

The usual musculoskeletal manifestations include myalgia and weakness and is also characterized by elevated creatine kinase levels [14-16].Weakness can manifest as reduced grip strength and decreased muscle strength and endurance in upper and lower extremities. This can seriously impact the return of the active work force thereby hurting the individual finances and the economy of the country.

Joint manifestations are characterized by arthralgias osteoporosis, osteonecrosis and chondrolysis [17]. The proposed ideology of the osteonecrosis is a combination of hypercoagulability and inflammation in the blood vessel walls. Autopsy studies have indicated that there is evidence of muscle necrosis as well as muscle atrophy combined with the inflammation. The elevated pro inflammatory molecules also cause damage to skeletal muscle and leads to proteolysis and decrease protein synthesis. Steroids being used for the lung condition can further compound the atrophy in the musculature [12]. The steroids usage and its duration for poor ventilatory support is responsible for the reduced bone density.

As patients recovered from the disease it has been observed that patient have a decreased strength and endurance which can last for months. Such patients benefit from enrolling in a rehab program.

At this point in time there is no convincing data to suggest that the anti-inflammatory medications which are used in the treatment of rheumatoid arthritis are beneficial in facilitating musculoskeletal recovery because of their potential action or blocking the mediators off inflammation. Their use in musculoskeletal manifestations is an off-label use and should be done after consulting rheumatological colleagues.

We are seeing a second surge across nations and disease manifestations appear to be more severe and treatment paradigms will continue to evolve. The orthopedic surgeon will be dealing with a plethora of these problems and should keep himself tuned to recent advances. It is important to note that patients who have recently recovered from covid and have musculoskeletal manifestations, such patients should not have elective procedures like joint replacement.

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