Coronavirus disease 2019 (COVID-19) is a fatal and highly contagious respiratory condition. With the ever-increasing number of corona cases worldwide, there has been an increased risk to each section of the society. Taking this scenario into consideration, there has been a major focus on the health of athletes by sports physicians and support staff involved in various events around the globe (Mehrsafar et al., 2020). Be it the state, regional, national, or the international level, most of the domestic and major international sporting events, even Olympics 2020 & world championships have either been postponed or canceled to safeguard the athlete’s health. When it comes to sports, it’s not only the athlete’s but also the coaches, doctors, physiotherapists, and the support staff who are also at heightened risk of contracting this disease. It’s the first time in sports history after the world war that the Olympics had to be postponed due to this Viral Pandemic.

Millions of people are affected worldwide with an extended duration of lock downs, isolation and quarantine owing to the COVID-19 pandemic. This has led to deconditioning effect in highly trained and even recreational athletes. The physical inactivity impacts the athlete’s performance there by increasing risk factors for diabetes, cancer, and cardiovascular disease due to lowered immunity. Although the forced sedentary life style of lockdown has affected both the younger and older population alike but the impact on the performance of the athletes who have to prepare for the national and international competitions has become a major concern in the sporting world both for amateurs and professional sportsmen.

Decreased inactivity levels during the pandemic has led to negative impacts not only on the physical fitness of individuals but also on the emotional, cognitive, and psychological components as well along with an increased risk of dementia (Livingston et al., 2017). Maintaining of mental health due to uncertainty, anxiety, fear and depression requiring counselling of general and sporting population has become another serious issue to be taken acre of.

The worldwide problem of coronavirus had led to reduced participation of the athletic population due to closure of all the schools, educational institutes, fitness centers, stadiums, swimming pools, fitness clubs, yoga studios, and parks as part of the lockdown guidelines. This further increased the screen time of the athletes making them inactive thereby increasing the sleep
disturbances, increased body weights and hence reduced sporting performance where all motor qualities be it endurance strength, speed skills and agility etc. have shown a drastic curve due to detraining effects. These deconditioning effects would be more pronounced in athletes from low-income families who even lack basic facilities to exercise at home owing to lack of space, substandard accommodations & training equipment. Even the athletes who are doing some physical activities on their own are performing unsupervised exercises and are at increased risk of injury and decreased level of fitness and conditioning.

With its direct negative potential in suppressing the neuroendocrine system and specifically targeting the immunity of the individuals, a more pronounced effect becomes visible in the individual suffering from COVID-19 (Cao, 2020). These physiological processes are closely related to the stress responses in the body and the stress resilience that takes place because of the same (Simpson & Katsanis, 2020). This would increase the detrimental potential of these processes owing to the long term influence of isolation, deprivation of social support, extended periods of inactivity, and lack of interaction with the coaches and support staff (Reardon et al., 2019).

Respiratory droplets have been found to be the primary factor in the occurrence of COVID-19 as the virus spreads through sneezing, coughing, and speaking. The spread of infection could also take place by the athlete touching a surface that has been contaminated followed by touching their mouth, nose, or eyes (Kannan et al., 2020; Zou et al., 2020).

The lungs of the individuals who recovered from COVID-19 infection showed an early or mid-phase alveolar damage along with fibrin thrombi in the small-sized arteries and capillaries (Carsana et al., 2020). Furthermore, a profound remodeling of the parenchyma of the fibrosis in lung tissue is seen along with proliferative changes in the fibroblasts, micro-level honeycombing, and obliteration of the airspaces in post COVID affected cases.

In order to reduce these deconditioning effects of physical inactivity, there is a need to devise guidelines for gradually re-introducing the physical activity in these individuals as the curve flattens in hot zones and unlock down is imitated by the respective countries. As per the World Health Organization (WHO) recommendations, a physical activity level of moderate-intensity for 150 minutes a week or a vigorous intensity level for 75 minutes a week is required for optimizing the musculoskeletal fitness. Due to the constraints put forth by the pandemic, the athletic population is not able to meet the minimum physical activity levels suggested by WHO. This reduced physical activity might prove to be detrimental in terms of an alteration of the immune system, exercise routines, and physical health along with initiation and exacerbation of existing pathology owing to the sedentary lifestyle.

Further interventions required for this sporting population include appropriate infection prevention etiquettes in the team sports and the individual events as well. Furthermore, the travel schedule of these athletes and supporting staff needs to be controlled with a Bio Bubble and
following laid down SOPS by Sporting agencies thus making bio secure environment in training, equipment, travel, competition and the boarding facilities

A global approach to this problem has been achieved by the formulation of digital content for the athletic population by coaches and trainers, including but not limited to yoga, stretching, dance, training drills, and skill training along with a special focus on concentration, training, and recovery meditation and applying psychological interventions too.

Taking into consideration the consequences of COVID-19 on lung functions, there is a need to work on the cardio respiratory system to enhance the efficiency of the lungs by improving the physiological and biochemical parameters via maximum aerobic & anaerobic power, Lactate threshold etc. For the unfortunate athletes who are found positive and are under hospital care following discharge, the players need to use an incentive spirometer to strengthen up the breathing musculature to ease off the process of breathing in order to make it less laborious and supplementing the training with deep breathing and even yogic exercises like Pranayama or Om Velom even.

Players must monitor the respiratory distress by measuring Oxygen saturation levels during exercise and thus use Pulse Oximeters and follow appropriate pulmonary rehabilitation protocols in the recovery period following the infection that includes respiratory conditioning and muscle strengthening exercises. Any drop of oxygen saturation below 88 during exercise should lead to immediate cessation of exercise. Simply even a talk test can be used during exercise for general population along with an optimal breath holding of 30 seconds.

Following infection of COVID-19 and during the recovery phase, support staff should also consider working on the psychological aspects as well by addressing the feelings of resentment, regret, isolation, and loneliness. Players should be well connected to their coaches, doctors, or physiotherapists to share their future objectives of rehabilitation after a Covid exposure and to improvise the simulator training of skill. A healthy diet and good sleep are also prerequisites of better mental health following the infection occurrence. One should aim for at least 7-8 hours of regular sleep. Daytime naps or bed rest should be avoided and exercises should be performed in the evening so that one would be tired by night and fall asleep without any extra effort. Furthermore, alcohol and caffeine intake, anxiolytics should be avoided and blue light filters should be used in all screens that are being used. Healthy diet with Antioxidants and immune booster supplements are advised specially Glutamine, Branch Chain Amino Acids, Zinc, Vitamin C, and D.

Return to play (RTP) is permitted without extensive testing if the athletes are negative or asymptomatic. Asymptomatic positive athletes should not do any exercise and training for 2-weeks along with strict isolation and can only walk of 5-7 minutes in the confined room three to four times a day. Cardiac and pulmonary testing must be carried out for these individuals, in case of any complications and periodic monitoring must be done.
For the athletes with mild to moderate symptoms, activity and exercise should not be performed for at least 2 weeks from the day of resolution of symptoms and a comprehensive assessment is required on the cardiac front taking into considerations the imaging and cardiac biomarkers. Common complications of Post Viral Myocarditis and Lung fibrosis must be kept in mind. RTP can be re-introduced with a close follow-up if no adverse symptoms or cardiac signs exist.

The ones with a history of severe COVID-19 infection depending upon the viral load reflected thru CT (cycle threshold) taken, needs to have utmost care of on the cardio pulmonary aspect and myocarditis should be acknowledged in all these athletes and must be investigated with sophisticated investigations like echocardiography, stress test ECG and even cardiac MRI along with cardiac biomarkers like Troponin levels. Minimum 2 weeks of rest following normalization of symptoms is required and repeated testing for the cardiac status is mandated to progressively introduce a graded exercise routine (Phelan et al., 2020).

Walking is generally recommended during the period of recovery but the duration and intensity should be gradual. The activity should only be resumed if one has properly recovered from the infection and are asymptomatic. Regular monitoring also needs to be performed for the saturation level of oxygen in the blood and it should be 95-100% at rest and not below 94% while performing exercises.

The virus may put a toll on the pulmonary capacities of the athletes and the effects may vary among individual athletes. Furthermore, returning to activity following coronavirus infection is rather a hectic process and it involves a 3-step process that takes into account the re-institutionalization of physical training, returning to the previous fitness and training load & intensity, and then return to competition. This process could take several months before an athlete could regain their premorbid status owing to the involvement of the cardio respiratory system and the long term deconditioning effect after low activity or no activity at all.

Alongside, the post COVID rehabilitation and recovery should be scientifically monitored in terms of intensity and volume of load in the elite sportsmen. High intensity and rigorous training are related to a decrease in immune activity lasting hours to a couple of days and hence the training sessions should be limited to less than 60 minutes and less than 70-80% of maximum efficiency.

Complete resolution of symptoms along with recuperation of energy levels mark the beginning of the training routine but with reduced intensity of Physical activity. The athletes who came in contact with a COVID-19 positive athletes should continue their training routine at their respective places and get the Rapid Antigen tests done and monitor their COVID App like AarogyaSetu.

Acknowledgments
Author is indebted to Prof Surindralal, Patiala & Ms Shilpy Malhotra, Noida for their inputs and editing.

References


