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J S M T JOURNAL OF SPORTS MEDICINE AND THERAPY
ISSN 2573-1726

Mini Review

Return to Play in High-level Athletes after SARS-CoV-2 Infection

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Abstract

In sports medicine, the recovery process for injuries to the musculoskeletal system has been well established, including the recovery time until the athlete can compete again to prevent relapses. These decisions support the sports physician in acting with greater confidence. However, there are no clear criteria and protocols for other systemic diseases. In the following study, we report our experience and suggest an action protocol for a professional basketball team.

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Submitted: July 23, 2024
Approved: July 26, 2024
Published: July 29, 2024

How to cite this article: Calvache S, Muñoz N. Return to Play in High-level Athletes after SARS-CoV-2 Infection. J Sports Med Ther. 2024; 9(3): 054-055. Available from: https://dx.doi.org/10.29328/journal.jsmt.1001082

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Keywords: Sports medicine; Recovery time; Professional athletes; Cardiovascular complications

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Introduction

The COVID-19 pandemic has altered training patterns due to lockdown policies affecting professional athletes, occupational professionals (e.g., firefighters, and police officers), and amateur athletes. For professional athletes who were confined, physical activity was limited to home exercises, while other fields required special modifications [1].

COVID-19 can cause complications that may impact the body during extreme exertion, typical in professional sports. Therefore, medical clearance is necessary for these individuals to resume activity, as complications can be severe (e.g., pulmonary embolism, pneumonia, myocarditis, neuropathies, chronic fatigue, cognitive dysfunction) [2].

Recovery depends on the athlete's previous health conditions, genetic factors, disease extent, and severity, among other factors. High-level athletes generally have better functional status pre-infection compared to the general population, which may moderate severity. For example, those with better pulmonary capacity, experience fewer hospitalizations than those with lower aerobic capacity [3].

Vaccination and the emergence of new variants have also mitigated severity, reducing recovery and return-to-play time, leading competitions to emphasize primary prevention [4].

Cardiovascular complications are of particular concern in athlete health, with cases of sudden death due to myocarditis reported. However, studies indicate very low incidence among asymptomatic athletes or those with mild disease. Sports medicine also includes managing fatigue, neuromuscular capacity deterioration, risk to other participants, and regulatory and legal requirements set by local governments [5].

It is crucial to conduct a thorough history, inquiring about cardiorespiratory symptoms (e.g., chest pain, exertional dyspnea, cough, tachycardia, lower limb pain or swelling, fever). This should be followed by an electrocardiogram, serum troponin (normal range 8,80 - 23,70 pg/ml), or transthoracic echocardiography (biventricular function, global contractility, and myocarditis signs). If pathological findings or moderate/severe disease are present, cardiac MRI should be included [4,6].

Some scientific societies initially recommended at least 10 days of physical activity abstinence, but these recommendations have since been reduced. Additionally, regulatory and legal requirements have prevented competition return without negative PCR results and a minimum quarantine period.

Methods

Our experience has involved pulmonary ultrasound (interstitial pattern), cardiac monitoring during the athlete's return to activity (heart rate sensors), and controlling training intensity and volume (tri-axial accelerometers). In moderate infection cases, we conducted walk tests measuring blood pressure, oxygen saturation, and heart rate, applied the Borg scale, and used symptom questionnaires. Championship regulations required blood tests with cardiac biomarkers (troponin), ECG, and echocardiography for competition clearance. Persistent dyspnea prompted CT scans and stress

tests since we have ergo-spirometry during preseason medical check-ups. For volume and intensity control, we began strength training with short series and extended recovery times, including injury prevention and muscle activation exercises. Intensity progression is determined by the athlete's symptoms and monitoring data.

During quarantine and with mild infections, rest was advised for the first days, followed by cycling at maximum lipolysis frequency. A specific diet rich in vitamins C, D, Zinc, and omega-3 was also recommended. Vaccination was timed to avoid interfering with competition or training, e.g., on rest days or vacations, ensuring no training 24 hours post-vaccination [7].

Discussion

We identified one case of mild diffusion impairment on ergo-spirometry, which did not prevent reaching maximum effort, and with no pulmonary consolidation on ultrasound, no further study was conducted. Another non-professional athlete with elevated cardiac biomarkers but normal ECG was advised to rest for three weeks, then progressively return without issues.

From a musculoskeletal perspective, we feared the impact post-first wave due to confinement and altered training and dietary routines. Thus, exceptional measures were taken for competition return, including health bubbles and significant precautions, preventing a notable increase in injuries. However, after subsequent waves, we and nearby clubs noticed a significant rise in injuries, particularly muscular ones. The first quarter of this season saw as many injuries as the entire previous year. The pathophysiological mechanism will need explanation through future epidemiological and etiophysiological studies [8,9].

Conclusion

To sum up, the COVID-19 pandemic has significantly impacted athletic health, particularly concerning systemic complications and musculoskeletal injuries. Our protocol, emphasizing thorough cardiovascular screening, rehabilitation, and gradual RTP has proven effective in managing athletes' recovery.

Establishing clear guidelines for managing systemic diseases in athletes is crucial to ensure their safe and efficient return to competition. Future studies should focus on understanding the long-term effects of COVID-19 on athlete health and developing comprehensive protocols to address these challenges.

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