Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Hellenic Journal of Cardiology 62 (2021) 175–177

Contents lists available at ScienceDirect

Hellenic Journal of Cardiology

journal homepage: http://www.journals.elsevier.com/hellenic-journal-of-cardiology/

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Proposed algorithm for return to sports in competitive athletes who have suffered COVID-19

Coronavirus disease 2019 (COVID-19) is an acute respiratory disease of various severity caused by the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2).[1,2] The cardiovascular system is the second most significant target of COVID-19[3] and involvement includes acute myocardial injury, myocarditis, arrhythmias, and venous thromboembolism. Reports document that in patients with COVID-19, the incidence of myocardial injury is estimated at 28% and is associated with fatal outcome.[4] In the acute phase of myocarditis, exercise may exacerbate viral replication, inflammation, myocardial cell death, arrhythmias, and may adversely affect the outcome leading to morbid complications.

Taking into consideration the uncertainties regarding the prevalence of asymptomatic COVID-19 cases in the community, the incidence of myocardial injury in COVID-19 patients with mild symptoms and the long-term outcome of COVID-19, a public health policy is required to guide the return-to-sports decision-making particularly for competitive athletes achieving a higher workload and intense exercise training. The present document provides an algorithm for the evaluation and management of athletes (over 14 years old) following infection from SARS-CoV-2 (Fig. 1) based on expert opinion and taking into account the position statements of the European Society of Cardiology Working Group on Myocardial and Pericardial Diseases on the management of myocarditis[5] and of Sport Cardiology Section of the European Association of Preventive Cardiology on the management of athletes with myocarditis.[6]

Athletes recovered from COVID-19 may return to competitive activities if tested negative for SARS-CoV-2 antigens with 2 sequential tests at least 48 h apart and pending cardiological evaluation (see below). Pneumological evaluation may be required in individuals with severe pneumonia, lung infiltrates, and hypoxia. A cardiological evaluation including clinical examination, ECG, and echocardiography should be performed during acute illness or at least before the resumption of competitive sports activities. High-sensitive troponin tests can be used to diagnose myocardial injury during the acute phase and up to 14 days after recovery from the disease.

In case the initial cardiological evaluation reveals abnormal findings, further evaluation should be applied. In particular, cardiac magnetic resonance imaging may detect myocardial involvement, such as features of acute myocarditis, confirming the diagnosis and adding prognostic information. Ambulatory ECG recordings should be applied to evaluate the arrhythmic burden. If clinical and diagnostic evaluation fulfills the diagnostic criteria of clinically suspected myocarditis, coronary artery disease should be excluded with coronary angiography (computed tomography or conventional) and if so, the athlete should be treated according to myocarditis guidelines.[5] In this case, a 6-month period of exercise restriction should be applied along with a recommendation for thorough cardiac reevaluation after this time period.[5,7,8]

If cardiac evaluation reveals abnormal findings but the diagnostic criteria of clinically suspected myocarditis are not fulfilled (i.e., isolated temporary elevation of high-sensitive troponin levels above reference limits), then alternative diagnosis should be considered (namely myocardial injury) and a 3-month period of exercise restriction should be recommended at this time with reevaluation before the resumption of athletic activities.[6]

Cardiopulmonary exercise stress test or stress test is recommended before the resumption of activities, in case of either myocardial injury or clinically suspected acute myocarditis.

In case of deterioration of the clinical status during the acute phase or detection of persisting cardiac abnormalities after the recommended period of restricted activities, further evaluation (e.g., with endomyocardial biopsy, etc.) in specialized units is advised.

As there are no definite data on the short- and long-term cardiovascular complications caused by COVID-19, the proposed approach is based on expert opinion and is subject to further refining as knowledge on the course of COVID-19 accumulates.

Peer review under responsibility of Hellenic Society of Cardiology.

https://doi.org/10.1016/j.hjc.2020.06.012

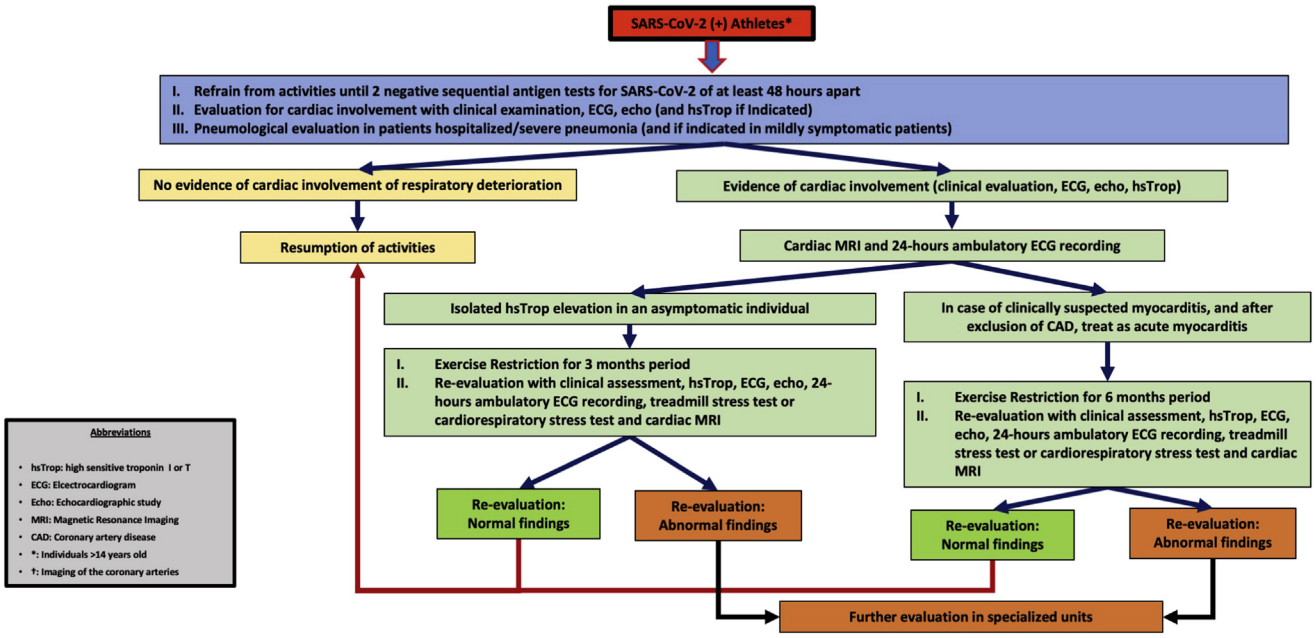

Fig. 1. Chart of the proposed algorithm for competitive athletes return to play.

Declarations of interest

None.

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2 June 2020
Available online 4 July 2020

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