

Cardiac MRI and Imaging Markers of Myocarditis in Competitive Athletes with Recent SARS-CoV-2 Infection: Results from The Big Ten COVID-19 Cardiac Registry

PURPOSE

To understand the frequency of myocarditis in student athletes recovering from SARSCov-2 infection.

METHODS AND MATERIALS

A central IRB for the Big Ten COVID-19 Cardiac Registry (coordinated by Ohio State University) approved this study. A survey of participating Big Ten University principal investigators reported the total number of athletes screened for SARS-CoV-2, the number with positive PCR, the number completing cardiac screening with and without CMR, and the number with findings that were consistent with myocarditis by the assessment of the local clinical team. CMR findings were classified based on updated 2018 Lake Louise criteria (LLC). The diagnosis of myocarditis by LLC requires presence of both a T2 based criterion (T2 mapping or T2 weighted abnormality) and T1 based criteria, (T1 mapping abnormality or late gadolinium enhancement (LGE)). Isolated right ventricular insertion point fibrosis was not used to diagnose myocarditis.

RESULTS

Comprehensive cardiovascular testing was performed in 1597 athletes comprised from 13 institutions. Thirty-seven were diagnosed with COVID-19 myocarditis (overall 2.3%, range per program 0-7.6%). Nine (24%) had clinical myocarditis and 28 (76%) had subclinical myocarditis. Twenty (54%) had neither cardiac symptoms nor cardiac testing abnormalities, except for CMR. If cardiac testing was based upon cardiac symptoms, only 5 cases would have been detected (detected prevalence 0.31%), and 32 (86%) may have been missed. CMR for all athletes yielded a 7.4-fold increase in detection. Follow up CMR performed in 27 (73%) demonstrated resolution of T2 elevation in all (100%) and late gadolinium enhancement in 11 (40.7%).

CONCLUSIONS

Among 1597 COVID-19 positive athletes with CMR screening, 37 cases of myocarditis were identified (2.3%). Subclinical myocarditis was more common than clinical myocarditis. The role of CMR as a screening tool in this population needs to be explored.

CLINICAL RELEVANCE/APPLICATION:

The implications of post-COVID myocardial injury detected by CMR are still unknown. This registry looks to study these questions in both the convalescent window and post-acute sequela of COVID-19.