Screening Athletes for Myocarditis With Cardiac Magnetic Resonance Imaging After COVID-19 Infection—Lessons From an English Philosopher

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In 1763, Bayes theorem (“An Essay Towards Solving a Problem in the Doctrine of Chances”), one of the most fundamental principles in probability theory, was published in Philosophical Transactions of the Royal Society. In a twist of fate, Thomas Bayes had died 2 years prior to the publication of his lasting legacy, which still resonates throughout modern clinical medicine. Bayes theorem is based on conditional probability, or the probability of an event occurring based on other conditions associated with the event in question. Today, bayesian philosophy and consideration of pretest probability remains embedded in the determination of best practices for clinical screening and risk stratification.

In the clinical care of competitive athletes, the emergence of coronavirus disease 2019 (COVID-19) and the marked tropism of severe COVID-19 infection on the cardiovascular (CV) system have raised concerns regarding the potential deleterious effects of COVID-19 infection on the heart of the healthy athlete. Moreover, recent single-center observational data from the collegiate athletic setting suggest subclinical myocardial injury and alleged myocarditis, as determined by cardiac magnetic resonance (CMR) imaging, may occur after mild and even asymptomatic cases of COVID-19 infection in young athletes. In these prior analyses, the return-to-play screening algorithm included mandated CMR imaging in addition to 12-lead electrocardiography, transthoracic echocardiography, and testing for cardiac troponin levels.

In this issue of JAMA Cardiology, Starekova and colleagues report their institutional return-to-play experience using comprehensive CV testing, including CMR imaging, for all collegiate student athletes recovered from COVID-19 infection. In this retrospective case series that included the largest number of competitive athletes to date, to my knowledge (N = 145; 108 male patients [74.5%]), several key observations are noteworthy. First, 77% of the cohort reported mild or moderate symptoms, 17% were asymptomatic, and no severe illnesses occurred. Second, the authors report only 2 athletes (1.4%) who were found to have CMR evidence of acute inflammation based on the Lake Louise criteria (CMR imaging was performed a mean [SD] of 21 [24] days after the onset of symptoms). In the athlete with the most marked abnormal CMR imaging, in combination with a small rise in troponin-I level, pericardial enhancement with an associated small pericardial effusion was also observed. This was the only case of presumed myopericarditis, which contrasts with a similar case series of 40 collegiate student athletes that demonstrated 40% (n = 19) with pericardial enhancement. For both athletes with evidence of myocardial inflammation in this report, systemic inflammatory biomarker levels were normal. Third, although no athlete reported severe symptoms, 28% reported moderate symptoms in which CV risk stratification is currently recommended, and subsequent electrocardiography, transthoracic echocardiography, and troponin-I levels were generally normal. Finally, there was a high burden of nonspecific abnormal CMR findings (n = 40 [27.5%]), particularly isolated late gadolinium enhancement localized to the interventricular septum at right ventricular septal insertion points (n = 38 [26%]). While more commonly described among masters-level endurance athletes, the clinical significance and prevalence of this finding in youthful athletes is uncertain and should not be assumed to be a normal consequence of intense athletic training in young competitive athletes.

Based on these results and because of the poor diagnostic yield of acute myocardial inflammation, coupled with the consideration of costs, level of expertise required for interpre-
Evaluation for Myocarditis in Student Athletes Recovering From COVID-19 With Cardiac Magnetic Resonance Imaging

ARTICLE INFORMATION

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REFERENCES