Long-term strenuous endurance exercise and the right ventricle: Is it a real matter of concern?

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To the Editor,

La Gerche and Claessen raised concern about the potential negative effects of exercise, especially strenuous endurance exercise (SEE) on right ventricle (RV) function in both healthy and ill populations.¹ This is in line with a recent meta-analysis by Elliott and La Gerche reporting that such type of exercise is associated with acute depression of RV systolic function, thus suggesting that exposure to repeated bouts of SEE can have potential long-term consequences.² La Gerche and Claessen argued that left atrial pressure is increased during SEE, thereby increasing pulmonary artery pressure.¹ Thus, they stated that frequent episodes of increased RV work induced by long-term SEE can promote compensatory RV remodeling, increase myocardial damage biomarkers such as troponins and B-type natriuretic peptide, or even accelerate heart failure (HF). However, to the best of our knowledge the bulk of the evidence available supports that the abovementioned alterations are rather transient, with a dose-effect relationship existing for exercise intensity and duration.

La Gerche and Claessen also state that SEE can promote acute and transient RV dysfunction, with repeated bouts leading to structural remodeling and arrhythmias of the RV.¹ In this regard, we recently reported that long-term participation in regular SEE, even at the professional level, does not seem to have negative consequences on RV systolic function, suggesting that, at least in healthy people, RV dysfunction induced by an acute bout of SEE is a reversible, physiological phenomenon rather than a pathological response.³ In fact, a recent meta-analysis from our group showed a standard mortality ratio due to cardiovascular diseases (CVD), including HF and coronary heart disease, of 0.73 (95% confidence intervals: 0.65, 0.82; p<0.001) in those engaging in the highest exercise (including SEE) levels, i.e., elite athletes of various
sport disciplines (n=12,119, mostly men), such as Tour de France finishers or Olympic marathoners, compared with the general population.\textsuperscript{4}

Physicians and health professionals should be aware that healthy individuals who engage in SEE sport events could exhibit acute, transient cardiological features that are apparently compatible with cardiac diseases, yet these alterations are attributable in most cases to transient physiological responses rather than pathological status. In fact, although pre-participation screening is recommended, especially in men aged 40+ years and with CVD risk factors (notably, diabetes), long-term SEE practice should not be discouraged in healthy population as it positively modulates the main risk factors for CVD, i.e., obesity, diabetes, hypertension or hypercholesterolemia.

**Competing interest statement**

The authors declare no competing interests.

**References**


2. Elliott AD, La Gerche A. The right ventricle following prolonged endurance exercise: are we overlooking the more important side of the heart? A meta-analysis. Br J Sports Med 2014