

The acute effects of an ultramarathon on biventricular function and ventricular arrhythmias in master athletes

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Funding Acknowledgements: Type of funding sources: None.

Background. Endurance sports practice has significantly increased over the last decades, with a growing proportion of participants older than 40 years. Although the benefits of moderate regular exercise are well known, concerns exist regarding the potential negative effects induced by extreme endurance sport. The aim of this study was to analyze the acute effects of an ultramarathon race on the ECG, biventricular function and ventricular arrhythmias in a population of master athletes.

Methods. Master athletes participating in an ultramarathon (50 km, 600 meters of elevation gain) with no history of heart disease were recruited. A single-lead ECG was recorded continuously from the day before to the end of the race. Echocardiography and 12-lead resting ECG were performed before and at the end of the race.

Results. The study sample consisted of 68 healthy non-professional master athletes. Compared with baseline, R-wave amplitude in V1 and QTc duration were higher after the race ($p < 0.001$). Exercise-induced isolated premature ventricular beats were observed in 7% of athletes; none showed non-sustained ventricular tachycardia before or during the race. Left ventricular ejection fraction, global longitudinal strain (GLS) and twisting did not significantly differ before and after the race. After the race, no significant differences were found in right ventricular inflow and outflow tract dimensions, fractional area change, s' and GLS.

Conclusions. In master endurance athletes running an ultra-marathon, exercise-induced ventricular dysfunction or relevant ventricular arrhythmias were not detected. These results did not confirm the hypothesis of a detrimental acute effect of strenuous exercise on the heart.

Abstract Figure.

