

**LONG DISTANCE STRENUOUS EXERCISE INDUCES A CARDIAC FATIGUE NOT ASSOCIATED WITH MYOCARDIAL INJURY IN HEALTHY HORSES.**

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In horses, international endurance races are rides from 80 to 160 km performed in 6 to 12 h. This is comparable to effort performed by human athletes doing long duration strenuous exercise. Irreversible cardiac injury has been suspected after such exercise in some athletes. Little is known concerning the cardiac consequences of such races in horses. The objective of this study was to examine the effects of a long distance endurance race on the equine heart.

Blood samples and echocardiography were performed before and within 45 minutes after completion of a race of 88 to 132 km in 13 horses. Systolic (s) and diastolic (d) left ventricular and aortic internal diameter (LVID and Ao, respectively) were measured from classical echocardiographic views. Heart rate (HR), peak flow velocity, and flow velocity integral were measured from aortic pulsed-wave Doppler recordings. The left ventricular fractional shortening (FS) and ejection fraction (EF), the stroke volume (SV) and the cardiac output (CO) were calculated from those measurements. Blood samples were taken on plain tubes, centrifuged after clotting, and the serum was drawn and directly frozen at -20°C until dosage of cardiac troponine I (CnTI) concentration using a commercially available Immunoassay System. The mean duration of the course was 7h28 ± 1h07 and the mean speed was 16.2 ± 1.3 km/h. After the race, LVIDd, LVIDs, Ao, EF, FS, FVI and SV were significantly lower and HR was significantly higher as compared with pre-race values. All horses had a CTnI under the detection limit (< 0.04 ng/ml) before the race. Eight of them had still a CTnI concentration under the detection limit after the race, and 5 of them had a detectable but physiological CTnI concentration after the race, with values ranging from 0.04 to 0.13 ng/ml.

Those results suggest that in the studied horses, long duration endurance exercise was associated with a decrease in left ventricular preload and a myocardial fatigue, but was not associated with a significant myocardial injury.