

# **ECHOCARDOGRAPHIC EVALUATION OF CARDIAC PERFORMANCE DURING STIMULATION WITH DOBUTAMINE IN CONSCIOUS HORSES: A PRELIMINARY STUDY**

**Sandersen C., Delguste C., Debrue M., Becker M., Guyot H. and Amory H. LIÈGE, BELGIUM**

---

Dobutamine stress echocardiography is a routine procedure in human medicine to determine cardiac pumping reserve (CPR), detect subclinical cardiac diseases and determine their prognosis. The aim of this study was to evaluate cardiovascular responses to a dobutamine stress test in conscious horses in order to evaluate the feasibility of this method to determine CPR in equine medicine.

Six horses age  $19.6 \pm 3.14$  (mean  $\pm$  s.d.) years (range 1–23 years) and mean  $\pm$  s.d. weight of  $495 \pm 61.96$  kg (range 455–575 kg), were used. The velocity time integral (VTI) of the aortic flow and the aortic diameter were measured by means of a 2.5 MHz sector probe, capable of pulsed wave Doppler analysis. Systolic arterial pressure (SAP) was measured noninvasively using a cuff placed around the tail. Heart rate (HR) was calculated from simultaneously recorded ECG tracings. Stroke index (SI), cardiac index (CI) and cardiac power output (CPO) were calculated from the measured parameters. Measurements were performed at rest and repeated under dobutamine infusion that increased from 2  $\mu\text{g}/\text{kg}$  bwt/min in steps of 1  $\mu\text{g}/\text{kg}$  bwt/min every 5 min. Criteria to stop the test were: no further increase in HR, VTI and SAP or an adverse reaction of the horse; sustained premature ventricular complexes (PVC); or a sudden raise in HR or SAP.

In all horses, dobutamine infusion had to be interrupted before the end of the test because of a severe increase in SAP ( $>300$  mmHg) associated with dyspnoea and obvious discomfort. The maximal dose of dobutamine reached ranged from 5–7  $\mu\text{g}/\text{kg}$  bwt/min. At this dose, HR, VTI, SI, and CI were not significantly different from resting values, while SAP and CPO were significantly increased. The mean percentage of increase in CPO at 2,3,4 and 5  $\mu\text{g}/\text{kg}$  bwt/min was mean  $\pm$  s.d.  $24.99 \pm 17.622\%$ ,  $57.34 \pm 19.08\%$ ,  $80.81 \pm 42.42\%$  and  $138.19 \pm 78.70\%$ , respectively.

This study demonstrated that dobutamine incremental challenge in conscious horses induces a severe systemic hypertension which limits its use in the measurement of cardiac pumping reserve.