USE OF ATROPINE TO INHIBIT VAGALLY MEDIATED BARORECEPTOR REFLEX IN HORSES UNDERGOING DOBUTAMINE STRESS TEST

C. Sandersen, J. Detilleux, C. Delguste, F. Gaciu, K. McEntee, H. Guyot, H. Amory

Dobutamine stress echocardiography is of increasing interest in equine medicine since it might increase chances to detect cardiac abnormalities associated with poor performance that are subclinical at rest, and allow to refine prognosis of cardiac diseases in general. Unfortunately, dobutamine has been demonstrated to provoke cardiac arrhythmias, severe hypertension and discomfort in conscious horses. Some of these side effects might be due to a vagally-mediated baroreceptor reflex. The aim of this study is to investigate whether atropine is able to block this vagal reflex and to reduce side effects of dobutamine.

In thirteen healthy Shetland ponies, aortic diameter and aortic flow were measured with pulsed waved Doppler-ultrasound at rest and during incremental steps dobutamine infusion. Seven of the ponies received dobutamine infusion at incremental rates of 5µg/kg/min for five minutes until a maximal rate of 40 µg/kg/min. The other 6 ponies received dobutamine infusion in incremental rates of 1 µg/kg/min every five minutes from 2 µg/kg/min to a maximal rate of 5µg/kg/min after premedication with two bolus of 0.025 mg/kg of atropine five minutes apart.

In both groups, cardiac output increased about 2.2-fold in response to the pharmacological challenge and this increase in cardiac output was mediated by an increase in heart rate, while stroke volume rather decreased. All ponies that received high dose dobutamine without previous atropine administration showed excessive restlessness, nervousness and cardiac arrhythmias. None of the atropinized ponies showed cardiac arrhythmias and restlessness was only slight.

We conclude that in the equine species, premedication with atropine is able to block the vagally-mediated baroreceptor reflex, which (1) allows to reduce dobutamine dose approximately 10 times to reproduce the same hemodynamic effects than dobutamine alone and (2) significantly reduces dobutamine-induced side effects.

Department of Clinical Sciences, Large Animal Internal Medicine, Faculty of Veterinary Medicine, University of Liege, Blvd. de Colonster 20, Bât. B42, B-4000 Liège