



MYOCARDIAL FUNCTION IN HORSES DURING GENERAL ANAESTHESIA EVALUATED BY CONVENTIONAL AND COLOUR- TISSUE DOPPLER ECHOCARDIOGRAPHY – A COMPARISON OF DIFFERENT METHODS

The aim of this study was to evaluate myocardial function of the anaesthetized horse by conventional echocardiography and colour- tissue Doppler imaging (TDI). Furthermore it was investigated whether the duration of anesthesia, age and weight of the horse had an effect on myocardial contractility.

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Twenty-five cardiologically healthy horses admitted for elective surgery were selected. Conventional and TDI measurements were performed before (T1), during (T2, T3) and after (T4) anaesthesia. A standardized anaesthetic protocol was used: sedation with a $\alpha 2$ -adrenoreceptor agonist combined with an opioid, induction of anaesthesia with guaifenesin and ketamine, and inhaled isoflurane for maintenance. During anaesthesia all horses were kept in left lateral recumbency. TDI parameters included isovolumetric contraction (IVC), systolic (S) as well as early (E) and late diastolic (A) maximal velocities.

During anaesthesia small but significant changes were noticed in T3 compared to T1 (decrease of fractional shortening and ejection fraction) by conventional echocardiography. Parameters determined by TDI of the right ventricular wall velocities showed significant reductions of T3 compared to T1: A decreased by $78.3 \pm 12.8 \%$ ($p \leq 0.001$), S decreased by $73.8 \pm 13.3 \%$ ($p \leq 0.001$) and IVC decreased by $63.8 \pm 34.6 \%$ ($p \leq 0.05$). When comparing T1 to T3 on the left ventricular wall A decreased by $43.0 \pm 22.2 \%$ ($p \leq 0.001$) and S decreased by $15.0 \pm 24.6 \%$ ($p \leq 0.01$). Significantly reduced T3 compared to T2 was measured by TDI but not by conventional echocardiography.

Colour-TDI as well as conventional echocardiography is a suitable imaging technique during anaesthesia. A direct impact of general anaesthesia on the kinetics of the heart and negative effects on the contractility in cardiologically healthy horses were registered. The results indicate a negative impact of the duration of anaesthesia on contractility.