

# Inspiratory breath holding in horses after recovery from anaesthesia

Bardell D, Waldmann AD, Campagna I, MacFarlane P, Auer U, Iff S, Bohm SH, Bettschart R, Mosing M; 50<sup>th</sup> Association of Veterinary Anaesthetists Autumn Meeting, Vienna, Austria, September 24-26, 2014

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The aims of this study were to evaluate the breathing pattern of horses after recovery from anaesthesia using electrical impedance tomography (EIT) and assess the effects on arterial blood gases.

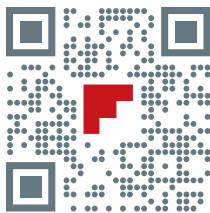
Six horses were anaesthetised for 6 hours in dorsal recumbency. Arterial blood gas and EIT measurements were performed 24 hours before (BL) and 1, 2, 3, 4, 5, 6, and 24 hours after the horses were standing following anaesthesia ( $t_{1-6}$  and  $t_{24}$ ). At each time point 4 representative breaths were analysed from a 2-minute EIT recording by evaluating the impedance change ( $\Delta Z$ ) during the inspiratory phase. The percentage of the total breath length where the  $\Delta Z$  remained higher than 50% of the total  $\Delta Z$  was calculated representing the normalized full width at half maximum (FWHM) of  $\Delta Z$ . Measurements of variables after anaesthesia were modelled with a fractional polynomial model and compared with baseline values. Cross-points between lower and upper 95% confidence intervals were estimated. A mixed random effects model was used to evaluate the effects of PaO<sub>2</sub> and PaCO<sub>2</sub> on breath holding.

All horses demonstrated inspiratory breath holding following recovery (BL,  $t_1$ ,  $t_2$ ,  $t_3$ ,  $t_4$ ,  $t_5$ ,  $t_6$  and  $t_{24}$  were  $40 \pm 10$ ,  $69 \pm 6$ ,  $58 \pm 10$ ,  $53 \pm 10$ ,  $53 \pm 14$ ,  $53 \pm 14$ ,  $46 \pm 9$  and  $35 \pm 9$  %, respectively). The FWHM was significantly longer until 3.1 hours after standing. No effect was found between breath holding and PaO<sub>2</sub>. However, none of the horses showed a PaO<sub>2</sub> < 8 kPa (mean PaO<sub>2</sub> 10.4 – 11.9 kPa) at any time point after recovery. Breath holding caused an increase in PaCO<sub>2</sub>.

Horses showed inspiratory breath holding after recovery from anaesthesia causing a decrease in alveolar ventilation. PaO<sub>2</sub> levels reached the physiologic range within one hour after gaining the standing position.

Acknowledgements: We want to thank the “Stiftung Forschung für das Pferd” for financing this project.

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Content: Dr. Stephan Böhm; Concept & Design: Zweizeit Brand Development