



Heart rate and cortisol release in horses during road transport of one, 3.5 and 8 hours duration

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In sport horses, equestrian competitions may lead to increased cortisol release. The competition itself but also a new environment or transport to the events can be considered as stressors. In this study, warm-blood sport horses (4-16 years, 4 mares, 2 stallions, 18 geldings) were transported by road for one (t1), 3.5 (t3.5) and 8 hours (t8), (n=8 per group). Heart rate (HR) is an indicator of stress and correlates with cortisol release. Heart rate was recorded with a mobile recording system (f810i, Polar, Kempele, Finland), fixed to a girth around the thorax of the horse and was monitored the day before transport, during transport and 12 hours thereafter. In addition, cortisol metabolite concentrations in faeces were determined in order to analyse adrenocortical activation during transport. Faecal samples were collected three times per day. Cortisol metabolite concentrations in faeces are increased approximately 24 hours after an elevation in plasma cortisol concentrations. Basal HR before transport did not differ between groups (45±2 (SEM) beats/min). During the first 30 min of transport, HR increased significantly (84±6, p<0.001, Kruskal-Wallis-H-test) but did not differ between groups. During the remaining part of the transport, HR was 61±6 beats/min (p<0.001 vs. first 30 min). When HR was analysed for the last 30 min of transport, values for groups t1 and t8 were significantly (p<0.05) higher than in group t3.5. HR decreased to baseline values within less than 30 min after transport and did not differ between groups (30-60 min after transport: 44±3 beats/min). Faecal cortisol metabolite concentrations on the day after transport were elevated compared to pre-transport baseline values in all three groups of horses. Significant differences existed between groups (e.g. 18 hours after transport t1: 91±5, t3.5: 110±18, t8: 136±27 ng/g; p<0.05). Based on HR analysis, horses of group t3.5 had adapted to transport, while the prolonged transport in group t8 again was a stressor. In group t1, which was transported only for one hour, the higher heart during the last 3 min of transport was still part of the initial rise in HR. After an initial increase, heart decreases indicating adaptation of the horse to transport. Cortisol metabolite concentrations in faeces indicate that transport causes adrenocortical activation with the amount of cortisol released depending on the duration of transport. Transport over medium distances appears to no major stressor and a negative impact on the performance of the horse is unlikely. Transport over 8 hours caused the most pronounced cortisol release and HR increases again during the last hours of an 8-hour transport. Transports exceeding this time may temporarily affect the subsequent performance of the horse in equestrian sports.

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