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Artikel: Heart rate and haematological responses in Quarter Horse during a reining competition

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Einsatz kann sie kommen, wenn Weichteilveränderungen aufgrund der vorangegangenen Untersuchungen erwartet würden, etwa eine Schädigung des Lig. supraspinale oder der Fascia thoracolumbalis. Insertions-desmopathien des Ansatzes des Lig. supraspinale an den Dornfortsatzspitzen könnten durch die Ultrasonographie verifiziert werden. Ebenso stellen sich Ausdehnungen von Hämatomen und Abszessen in der Muskulatur dar. Zur Diagnose von Neoarthrosen, cystoiden Defekten und sog. kissing spines kann die Sonographie nicht herangezogen werden, da die Zwischenwirbelbereiche meist nicht beurteilbar sind.

Equine protozoal myeloencephalitis

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Equine Protozoal Myeloencephalitis (EPM) is currently the most frequently diagnosed neurologic disorder in horses in the US. EPM is caused by the protozoan organism Sarcocystis neurona. Typically, Sarcocystidae have an obligate prey-predator life cycle, where asexual stages can be found in the muscle of prey animals, and sexual stages of their reproduction within the intestine of their specific predator animals. S. neurona uses birds as intermediate and the opossum (idelphis virginiana), a marsupialian animal native to the Americas, as the definitive hosts. The horse is an aberrant host, and can become infected after ingestion of infectious oocysts. The protozoan stages enter the CNS, however, they are unable to mature within the CNS, and therefore are they neither infectious for the opossum, nor for other horses.

With the (American) opossum as the definitive host of S. neurona, EPM is an American problem, however, EPM can occur in horses exported from the US. The clinical signs vary, depending on the location of the parasite within the CNS. The damage is caused by the presence and further multiplication of the protozoan organism, and the associated inflammation. The infection can also be multifocal. An asymmetric ataxia of the limbs, with or without lower motor neuron involvement is the most frequently found complaint at presentation. Seroprevalence among horses varies depending on climate, and the presence of the definitive host, the opossum; seroprevalence can be as high as 60%. However, seroprevalence does not correlate with clinical disease. So far, a vertical infection from the mother to the developing foal has not been demonstrated. The clinical disease seems more frequent in Standardbreds and Thoroughbreds, and least likely in ponies.

EPM is diagnosed ante mortem by the presence of clinical neurologic signs, a positive immunoblot assay showing intrathecally produced antibody against S. neurona, and improvement with therapy. The most established treatment is a combination of sulfadiazine and pyrimethamine, which are administered for an average period of six months. Treatment goals are to treat until the immunoassay on cerebrospinal fluid is cleared from intrathecally produced antibodies. Currently diclazuril and toltrazuril are under clinical evaluation in several field trials.

Current problems with the disease complex "EPM" are the treatment, and its efficacy, as well as the lack of criteria when to discontinue medication. In more than 90% of the horses treated for EPM for at least six months the immunoblot assay on cerebrospinal fluid remains positive. Explanations for this phenomenon may be inefficacy of the therapeutics in use or resistance development of the parasite; chronic reinfection, or persistent infection, as described for Toxoplasma spp. infections in other species. Intensive further research in epidemiology and the mechanism of host-parasite interaction is necessary to clarify the complexity of this disease.

Heart rate and haematological responses in Quarter Horse during a reining competition

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Reining is a classical Western discipline with manoeuvres requiring fast and powerful muscle contractions and motoric skills. It is considered an «anaerobic» discipline, but there are no studies showing the degree of anaerobiosis induced by an American Quarter Horse Association reining pattern. Measurement of heart rate and plasma lactate are established methods in sports medicine to estimate the workload of a sports discipline. The purpose of this study was to estimate the work intensity of a reining pattern and haematological responses of trained Quarter Horses during a reining competition. Twelve Quarter Horses between 4 and 8 years of age were equipped with a heart rate meter (Hippocard®, Isler Bioengineering AG, Zurich) at a National Reining Horse Association approved horse show. Heart rates were continuously recorded from about the last 30 minutes of the warm-up until 2 minutes after leaving the arena. The performance of each participant was video recorded and heart rates subsequently assigned to the different manoeuvres. Blood samples were taken one day before the class for resting levels and 1 minute after completion of the pattern. Plasma samples (S-Monovette®) for lactate measurement were immediately centrifuged and shock frozen in liquid nitrogen until processing. Plasma lactate was determined by a photometric method (Boehringer, Mannheim). Data were analysed by paired t-tests or Wilcoxon signed-rank tests. Average time needed to com-

plete the pattern was 2:53 ± 0:09 minutes over a distance of about 680 meters. The day before competition serum chemistry, haematology, and plasma lactate were within reference range in all horses. One minute after completion of the pattern mean plasma lactate increased significantly ($p < 0.001$) to 5.1 ± 1.9 mmol/l [2.0–8.0 mmol/l]. No correlations were found with time or final score. PCV increased ($p < 0.05$) to 48.6 ± 2.8% with concomitant significant changes in the number of red blood cells (10.6 ± 0.8 × 10^{12}/l), haemoglobin concentration (17.5 1.2 g/dl) and related parameters. The number of white blood cells increased significantly to 10.01 ± 1.50 × 10^9/l with a shift in the percentage of neutrophils from 58.1 ± 6.8% to 55.1 ± 8.7% and in lymphocytes from 38.3 ± 7.5% to 39.5 ± 8.6%. During warm-up heart rate was 62 ± 6 beats per minute (bpm) at walk, it increased to 78 ± 11 bpm at entrance into the arena and to 83 ± 8 bpm while standing in front of the judges. The heart rate increased continuously at the beginning of the performance (1st spin: 105 ± 16 bpm, 2nd spin: 126 ± 16 bpm) until a plateau was reached with 165 ± 23 bpm during galloping. Highest heart rates were induced by roll-backs and stopping with 181 ± 13 bpm. One minute after completion of the pattern heart rate dropped to 86 ± 12 bpm. In conclusion, reining at competitions leads to increased anaerobic glycolysis and subsequent mild to moderate accumulation of lactate. Stops and roll-backs are requiring the highest work efforts. Aerobic conditioning in combination with fast power training seems to be indicated in the training of reining Quarter Horses in addition to practising motoric skills.

Carbon screws in treatment of proximal phalanx fractures in horses – preliminary results of biomechanical investigations in vitro

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Introduction: In years 1994 and 1995 horses with bone fractures formed 22% of all patients treated at the Large Animal Surgery Department in Warsaw. Proximal phalanx fractures made up about 30% of all bone fractures evaluated. The most common proximal phalanx fractures were sagittal longitudinal proximal fractures. Their fixation by using steel orthopaedic lag screws gives good results. Differences between the elasticity of bone and steel screws are causing painful stress in bone which may cause a lameness. That's why it is necessary to remove steel implants what prolongs recovery time. Using screws with a modulus of elasticity which is similar to that of the bones, for example carbon screws, can shorten the recovery time and allow the horse to return to the race track. The aim of the study was to estimate mechanical properties of fixation achieved by steel and carbon screws.

Materials and methods: Pairs of proximal phalanx bones of horses that died or were euthanised for reasons not related to changes in bones were studied. Elasticity of cortical bone of proximal phalanxes was estimated in a three point bending test. The compression of proximal phalanx bones between a cylinder placed in the furrow on the proximal articulate surface and a metal box filled up with teflon, on which the distal surface of bone stood, were performed to estimate forces causing: a) longitudinal proximal sagittal fractures of proximal phalanx, b) destruction of bone fixation by using steel screws, c) destruction of bone fixation by means of carbon screws.

Results: Modulus of cortical bone elasticity in the proximal phalanx of horses determined in three point bending test ranged between 1,2 and 5,2 Gigapascal [GPa], (x = 3,21 GPa +/- 1,53 GPa). In order to make a sagittal fracture of proximal phalanx, forces from 10 500 Newton [N] to 48 000 [N] (x = 24 782 [N] +/- 7734 [N]) are necessary. Forces destroying a fixation by steel orthopedic screws were between 10 500 [N] to 25 000 [N] (x = 14 192 [N] +/-4747 [N]). Forces destroying a fixation of proximal phalanx fractures by carbon screws ranged between 4200 [N] and 12 900 [N] (x = 8400 [N] +/- 3370 [N]).

Conclusions:

1. The calculated modulus of elasticity of cortical bone of the proximal phalanx is more similar to the elasticity of carbon than the steel screw.
2. Forces destroying a fixation of proximal phalanx fractures by carbon screws are 3 times lower than these destroying a fixation by steel screws.
3. Loading capacity of proximal phalanx fracture fixations in vitro achieved by carbon screws may be sufficient in order to use them for fracture fixation of proximal phalanxes in horses.

Krankheiten des Oesophagus beim Pferd – eine retrospektive Untersuchung anhand von 37 Fällen

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In die vorliegende Untersuchung wurden 37 Patienten einbezogen, die zwischen Januar 1993 und April 1998 mit einer Erkrankung des Oesophagus an unserer Klinik vorgestellt wurden.

Die Anamnese, die Ätiologie der Krankheit sowie die klinische Symptomatik, Therapie und Prognose wurden anhand der Krankengeschichten retrospektiv analysiert.