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Proceedings & Abstracts

EQUINE MEDICINE & SURGERY
POSTER SESSION ABSTRACTS
EVALUATION OF BIOCHEMICAL AND MINERAL PARAMETERS IN FOALS OF BREED NORIK MURÁŇ TYPE

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Biochemical and mineral analysis in horses are important to determine the correct clinical diagnosis of general, some infectious and parasitic diseases. Reference values of blood parameters may vary depending on the breed, age and also are affected by breeding conditions. The aim of the study was to monitoring of changes in biochemical and mineral parameters from first day of foaling until 60 days of life in 24 cold-blooded mares breed Norik Muráň type. Blood samples were collected from v. jugularis using vacuum tubes (Serum-SST™IIAdvance, BD Diagnostics, USA). Biochemical parameters of glucose (Glu), total protein (TP), albumin (Alb), aspartate aminotransferase (AST), gammaglutamyl-transferase (GMT), alkaline phosphatase (ALP), cholesterol (Chol), calcium (Ca), phosphor (P), natrium (Na), kalium (K) and chloride (Cl) were determined by COBAS c 111th. The results were statistically evaluated using statistical methods Correl. The foals were divided in two groups (G1, n = 6, first week post partum; G2, n = 6, eighth week post partum) and evaluated by Student t-test (Microsoft Office Excel 2010). The negative correlation was found in Glu (r=-0,54); Alb (r=-0,35); ALP (r=-0,61) and Chol (r=-0,49) (r=+0,29 - -0,69). The positive correlation was found in AST (r=0,52); P (r=0,52) and K (r=0,55) (r=-0,29 - +0,69). The significant differences were evaluated between groups G1 vs. G2 in Glu (8,8±0,63 vs. 7,03±0,38; P<0,01); ALP (22,94±4,4 vs. 11,78±2,39; P<0,01); Chol (5,83±0,89 vs. 4,03±0,7; P<0,05); P (2,04±0,41 vs. 2,77±0,2; P<0,05) and K (4,68±0,26 vs. 5,4±0,32; P<0,05). No significantly correlation were found in TP; GMT; Ca; Na and Cl. Data obtained from this study can enhance our understanding of the biochemical and mineral parameters in this species allowing the veterinarian to establish appropriate interpretation of laboratory data and give these animals the appropriate care. Determination of biochemical and mineral parameters is specific in Norik Muráň type, as a result of a specific breed and the breed selection. This study was supported by grant from the Ministry of Education of the Slovak Republic VEGA 1/0498/12.
HORSE GAIT SYMMETRY ASSESSMENT WITH DYNAMIC ACCELEROMETER DYNAPORT

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Evaluation of clinical usefulness of fast, repetitive, objective methods of accelerometeric measurement of horse movements was the aim of this examination. Methods: the assessment of temporal, and spatial parameters of particular horse gait cycles in trott pattern with Dynaport Mc Roberts accelerometer, fixed in special frame on horse’s rump, with posterior spinus iliacus used as a typical landmarks for design positioning. Horses were led on paved natural sand surface on the distance of 10 meters. The inter and intra animals analysis were performed. The gait cycle was divided on 4 consecutive phases-unilateral pelvic leg swing and ground support phases and in consequences: 2 unilateral ground support (left and right) and 2 bilateral ground support. Five mares aged from 7 to 10 y.o. examined in the same conditions. The detailed analysis of 3 consecutive gait cycles from 9 walking samples. Results: Temporal parameters: the most stable measurement is the total time of ground support of pelvic limb obtained the phase of uni- and bilateral support, with the range from 0,919±0,105s to 0,774 ± 0,052s (coefficient factor (CF) 9,34%) for left hind limbs and from 0,762±0,037s to 0,917±0,085s (CF 8,1%) for right hind limbs. The measurement of angular acceleration during unilateral pelvic limb swing phase appeared to be stable and repetitable parameter for intra observations of each horse movements. The range of acceleration during swing phase for left hind limb from 1,517±0,180m/s² to 1,566±0,145m/s² (CF 7,9%) and from 1,563 ± 0,142m/s² to 1,979 ± 0,211m/s² (CF 9,78%).
EVALUATION OF OXIDATIVE STRESS AND MUSCULAR INJURY MARKERS IN HORSES SUBJECTED TO LONG TERM EXERCISE

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The excessive oxidants generation or antioxidants failure which occurs during the long term exercise may induce the oxidative stress. The purpose of the present study was to evaluate the oxidant and antioxidant profile, as well as muscle injury markers in horses undergoing endurance race. Nine Arabian horses completed 80 km endurance after three months training program[1]. Venous blood samples were taken before, after competition and within the recovery period. Oxidative stress indicators as malondialdehyde (MDA), advanced oxidation proteins products (AOPP), glutathione (GSH), vitamins A and E levels were assessed. Values of serum aspartate aminotransferase (AST) and creatine kinase (CK) were also obtained. The values were analyzed by ANOVA, and the means were compared using Tukey’s test (P<0.05). AOPP baseline average values were 75.4µmol/L. Although statistical differences were not found, there was a relative increase of AOPP after the end of endurance (78.5µmol/L) and a 27% decrease 72 hours after exercise (57.5µmol/L). Moreover, the average concentration of GSH decreased at the end of the competition (1.1µmol/gPT) comparing to baseline values (1.6µmol/gPT). The CK levels increased 4 hours after the end of competition (618.2UI/L), comparing to baseline (151.9UI/L). AOPP and GSH shifts occurred probably due to an attempt to regulate the oxidant/antioxidant balance. The changes observed in AOPP and GSH were associated to maintenance of oxidant/antioxidant balance, but the establishment of this balance did not prevent the occurrence of oxidative stress and, consequently, light muscle damage associated with CK elevations.

EFFECTS OF ARTHROSCOPY UPON SYNOVIAL FLUID BIOMARKERS IN EQUINE JOINTS WITH OSTEOCHONDRITIS DISSECANS (OCD): PRELIMINARY RESULTS

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Objective. Evaluate the early effects of arthroscopy upon synovial fluid biomarkers in equine tibiotarsal joints with OCD.

Methods. Synovial fluid markers of inflammation prostaglandin E₂ (PGE₂), and of cartilage and synovial fluid integrity, glycosaminoglycans hyaluronic acid (HA) and chondroitin sulfate (CS), were measured in five OCD tibiotarsal joints just before (preoperatory) and 48 hours after arthroscopic removal of intermediate ridge distal tibia osteochondral fragment (postoperatory). Analgesic and anti-inflammatory therapy with phenylbutazone (4.4 mg/kg IV once a day) was performed for 3 days in postoperatory period.

Results. In comparison to the preoperatory samples, the concentration of PGE₂ and HA did not vary (PGE₂ preoperatory, 31.48±18.22 pg/mL; postoperatory 22.56± 12.20 pg/mL ; HA preoperatory 680.00±144.23 mg/mL; postoperatory, 744.32± 219.92 mg/mL ). In contrast, the concentration of CS was 2 ½ times increased in postoperatory synovial fluid in comparison to preoperatory (preoperatory, 112.94±61.02 mg/mL; postoperatory, 292.69 ±185.86 mg/mL; P<0.05).

Discussion and Conclusion. Our results suggest that phenylbutazone was efficient in controlling inflammation, since PGE₂ concentration did not increase in postoperatory synovial fluid. The concentration of HA also did not vary. In contrast, the increase in the CS concentration 48 hours after surgery clearly indicates an enhancement in articular cartilage catabolism, possibly triggered by the arthroscopic procedure. Therefore, the use of joint therapies in order to avoid articular cartilage degradation just after arthroscopy in association with systemic nonsteroidal anti-inflammatory drugs would be beneficial for the early restoration of joint homeostasis and could help in preventing secondary cartilage lesions.
Evaluation of the cardiopulmonary effects of midazolam-guaifenesin maintenance anesthesia protocol during orchiectomy in horses.

Five healthy stallions undergoing castration were pre-mediated with romifidine IV, 15 minutes before induction of anesthesia with Ketamine and Diazepam. Anesthesia was maintained with Midazolam (0.1 mg/kg) in 500 ml of Guaifenesin 5% solution. Cardiopulmonary parameters were evaluated before (M0), 10 (M1), 15 (M2), 25 (M3) and 35 (M4) minutes after anesthesia induction. Heart rate (HR), respiratory rate (RR), rectal temperature (RT), oxygen pressure (PO$_2$), carbon dioxide pressure (PCO$_2$), pH, hemoglobin oxygen saturation (SO$_2$) and bicarbonate (AB) of arterial blood were measured. Diastolic (DAP), mean (MAP) and systolic (SAP) arterial blood pressure were evaluated from M1 to M4.

Although HR and RR did not change, DAP, SAP, and MAP decreased in M4 when compared to M1. Mean RT values decreased in M4 (37.1°C) when compared to M0 (38.0°C) and M1 (37.8°C). Arterial blood pH, PCO$_2$ and AB remained constant over time. However, SO$_2$ and PO$_2$ gradually decreased in M2 (91.8%; 75mmHg), M3 (91.2%; 73mmHg) and M4 (91.4%; 72mmHg) when compared to baseline values (95.8%; 82mmHg).

Midazolam-guaifenesin protocol proved to be safe and efficient for castration in horses, with little cardiovascular and respiratory changes. Decrease in SO$_2$ and PO$_2$ could be associated with recumbency and the absence of oxygen supplementation during the procedure. Association of midazolam-guaifenesin ensures a safe and low-cost solution that reduces ketamine reapplication during short surgical procedures.
The term developmental orthopedic disease (DOD) was first defined in 1986. DOD encompasses all orthopedic disorders observed in the growing and young horse that cause a disturbance in conversion of cartilage to weight-bearing bone. It includes osteochondritis dissecans, subchondral cystic lesions, angular limb deformities, physitis, flexural deformities, cuboidal bone abnormalities, juvenile osteoarthritis, and cervical vertebral malformation. The study group consisted of 10 foals with DOD and control group consisted of eight healthy foals (3-8 month). In clinical examine; Lameness, swelling joints and pain were observed in all foals. Clinical, radiographical and pathological findings in ten foals indicated of DOD. Serum Cu concentration of foals with DOD were significantly lower than that of control group (0.094±0.011 mg/kg, 0.932 ± 0.068 mg/kg, respectively; \( P<0.05 \)). Serum Zn levels (1.828 ± 0.180 mg/kg, 0.926 ± 0.052 mg/kg, respectively, \( P>0.05 \)), serum Ca levels (187.836 ± 7.921 μg/dL vs. 150.912 ± 5.271μg/dL, respectively, \( P>0.05 \)), and serum P levels (247.339 ± 10.729 μg/dL vs. 190.470 ± 5.775μg/dL, respectively, \( P>0.05 \)) was observed in foals with DOD and healthy foals. There were no statistically significant differences between the DOD group and control group with respect to serum levels of Ca, P, Zn, Na and K. We concluded that DOD is associated with reduced serum levels of Cu in foal. Copper is important trace element for growing foals.
EFFECT OF DIETARY LEPIDIIUM MEYENII-EXTRACT ON RELATED SERUM HORMONES IN ENGLISH RACE HORSES

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Any study done with Lepidium meyenii were no found in horses and so, aim of this study was to investigate the usage of Lepidium meyenii having the high nutritional value and rich content in feeding of race horses. 5+ years olded 18 English horses were separated into three equal groups. Groups were control group fed with basal diet, Lm50 group fed with supplemental 50 g/day Lepidium meyenii-extract and Lm75 group fed with supplemental 75 g/day Lepidium meyenii-extract. Bloods were taken before feeding, during feeding and 15, 30, 60, 120 to 240 minutes after feeding on day 30. Addition of Lepidium meyenii to diets was ineffective on serum ghrelin and leptin. Adiponectin was higher in Lm50 group than other groups 30 minutes after feeding (p<0.05). Insulin levels were lower in trial groups than control group 60 minutes after feeding, and higher in Lm50 group than Lm75 group 120 minutes after feeding (p<0.003). TSH was lower in Lm50 group than control group during feeding, and higher in Lm50 group than Lm75 group 15 minutes after feeding (p<0.05). T₃ concentrations were higher in Lm75 group than other groups during feeding and 15, 30, 60, 120 to 240 minutes after feeding (p<0.001). T₄ was significantly higher in Lm75 group than other groups 60 minutes after feeding. As conclusion, supplemental Lepidium meyenii-extract did not cause any health problem in horses at this study. Addition of 50 g/day Lepidium meyenii-extract may more suitable.
EVALUATION OF CD14 RECEPTOR IN HORSES WITH EXPERIMENTAL SMALL COLON INTRALUMINAL OBSTRUCTION

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Endotoxemia is an important cause of morbidity and mortality in horses. This disease is caused by the release of lipopolysaccharide (LPS) when there is rapid bacterial replication, lyses or death. The LPS binds to CD14 receptor on the surface of mononuclear phagocytes. This complex interacts with Toll-like receptor 4 (that have transmembrane and intracellular components and initiate the inflammatory response). This massive inflammatory reaction is called systemic inflammatory response syndrome (SIRS). Although much of the focus of research on endotoxemia in horse has centered on intestinal strangulation obstruction, these are not the only disease conditions characterized by endotoxemia. Therefore, the aim of this study was to evaluate CD14 receptor in horses with experimental intraluminal obstruction. For this purpose, eight healthy adult mixed-breed horses were subjected to small colon distension induction using a surgically implanted latex ball in the lumen [1]. Blood samples were obtained and processed with antibodies for flow cytometry one day before the induced, after four hours of obstruction and 72 hour after latex ball removal (M0, M4 and M72, respectively) [2]. Data from 10000 events were collected and submitted to One-Way ANOVA and Tukey’s post hoc test. Mean of free CD14 receptor percentage (± standard deviation) at M72 (0.54±0.49) was significantly lower when compared to M0 (1.56±1.21). Thus it is concluded that there has been activation of the defense line leukocyte, demonstrating that a non strangulate intraluminal obstruction can also trigger SIRS.


Standing procedures to diagnostic and therapeutic purposes are very common in equine practice, however it is often necessary sedate the animal, even when aren’t healthy. The aim of this study was evaluate the sedative and cardiovascular effects of acepromazine-pethidine association in horses. Six healthy animals (12±2 years old; 343±49 bwt) were submitted to neuroleptanalgesic anesthesia using 0.05mg.kg\(^{-1}\) of acepromazine intravenously, followed, ten minutes after, by 4mg.kg\(^{-1}\) of pethidine intramuscularly. The sedation was evaluated by clinical observation and head height to the floor. The cardiovascular parameters measured were heart rate, respiratory rate, mean arterial blood pressure, central venous blood pressure, cardiac index (by thermodilution method) and arterial blood gases at baseline, 5 and 10 minutes after acepromazine (T\(^{-5}\), T\(^{-10}\)) and 5, 10, 20, 30, 40 and 50 minutes after pethidine (T\(_5\), T\(_{10}\), T\(_{20}\), T\(_{30}\), T\(_{40}\), T\(_{50}\), respectively). Results: it was not observed ataxia in any horse and all animals showed evident sedation as lower head, ptosis, limb abduction and penile relaxation in males. The significant head height reduction (35%) was observed after acepromazine (T\(^{-10}\)) and after pethidine (T\(_{10}\)). Respiratory rate decreased significantly in all-time points after acepromazine administration. Mean arterial blood pressure decreased significantly in T\(^{-10}\) to T\(_5\) and central venous blood pressure in T\(_{-5}\) to T\(_5\). Cardiac index increased only at T\(_{50}\). A slight reduction in arterial pH was observed at T\(_{30}\). Conclusion: In this study, the acepromazine-pethidine association caused satisfactory sedation with mild cardiovascular effects, establishing a good option for sedative purposes.

Keywords: equine, sedation, neuroleptanalgesic anesthesia, cardiac index.
EFFECTS OF LIVE YEAST (NCYC SC47) SUPPLEMENTATION ON BEHAVIOURAL REACTIVITY SCORES IN STABLED HORSES

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Topic: 7. Equine Medicine and Surgery

Live yeast has been proven to exert a calmative behavioural influence on species such as captive fowl and ruminants. The positive behavioural effects of yeast have been linked to a mediatory effect exerted upon dopamine receptor populations in both the gut and the brain. This study sought to determine if similar behavioural effects occur in the domestic horse when fed live yeast (NCYC Sc47). Eight healthy horses were housed in 12” x 12” stables, exercised twice daily and fed a forage:concentrate diet. All horses were considered to be in light work and all were maintained at a body condition score of 5. The experiment was designed as a cross-over study consisting of two treatment periods. The animals were assigned to one of two treatments (no yeast or 10g of yeast (NCYC Sc47) per day). Each treatment period consisted of three weeks adaptation, 5 days data collection and two days cross-over. Behavioural reactivity scoring is a validated method for rating the behaviour of animals in certain settings. During the collection periods, horses were observed during normal management tasks and scored on a Likert scale of 1-10 by three separate individuals and the scores meaned. Data was analysed by Wilcoxon’s test for matched pairs. The mean scores of horses supplemented with live yeast were significantly (T= 0; P<0.001) higher than without supplementation. The results would indicate that feeding live yeast (NCYC Sc47) to stabled horses can reduce reactivity and induce positive behaviour patterns.
DETERMINATION OF PASTEURELLA CABALLI BY PCR IN BRONCHOALVEOLAR
LAVAGE FLUIDS (BALF) OF THOROUGHBRED ARABIAN FOALS

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Objectives: The aim of this study was to determination of Pasteurella caballi (P. caballi) by conventional methods and 16S rRNA gene sequences PCR in bronchoalveolar lavage fluids (BALF) of thoroughbred Arabian foals.

Materials and Methods: In the present study, BALF samples were collected from the number of 13 thoroughbred Arabian foals. BALF samples were obtained at five times in intervals of ten days by the intratracheal catheter. It was inoculated sheep blood agar and incubated under aerobic conditions at 37 °C for 24 h. Conventional and biochemical characteristics of Pasteurella ssp. suspected colony were determined. DNAs were extracted from the BALF samples and the bacteria which were identified as P. caballi according to the biochemical test. The primers L-5’-cagccacactggaactgaga-3’ and R-5’-ttaggcttctaactggaactgaga-3’ were used to amplify a 203 bp fragment of 16S rRNA gene sequences in P. caballi strains. The primers were designed by Primer3 program.

Results: In total, 25 (38.4%) Pasteurella ssp. were isolated from 65 BALF samples at the end of the culture. These strains identified as P. caballi according to the biochemical characteristics. In PCR analysis of 65 BALF samples, 40 (61.5%) samples gave positive bands at the 203 bp sequence and were identified as P. caballi.

Discussion: Our results demonstrated that, P. caballi is been very common on the mucos membranes of the respiratory tract of the Arabian horse. Compared with the culture results, the 16S rRNA-PCR is very useful for the determination of P. caballi from horse BALF samples.
TRACHEAL COLLAPSE IN AN AMERICAN MINIATURE HORSE. CLINICAL EVALUATION, FINDINGS AND DISCUSSION OF THIS PATHOLOGICAL CONDITION.

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Objective: To assess clinical sings, pathological findings and treatment of tracheal collapse.

Case description: An American miniature horse 7 years old, male, was presented with respiratory distress at teaching hospital of college of Veterinary Medicine - UCV. Previous BAL, 3 months earlier, was positive for *Streptococcus spp.*, treated but transitory recovery; respiratory distress kept recurring.

Results: Clinical evaluation revealed COPD. tests showed high levels of kallikrein and histamine. Cervical-Thoracic xrays, tracheal endoscopy showed severe stenotic collapse from the middle third of the cervical trachea to proximal third of thorax. Lateral-oval collapse with striations on tracheal cartilage was very prominent. The cardio-respiratory parameters revealed a severe decreased of PO2 during the exercise (60%) with consequent increased RF (32 r/m). Electromyography of cervical-thoracic and doppler ultrasound uncovered a decrease in electromyography limits at the end of inspiration prolonged to the expiration, as well as marked collateral vascularization at anterior-cranial lungs segments.

Conclusion and Discussion: Therapy improved patient based on the stimulation of immune response and reduce respiratory distress by bronchodilators (Clenbuterol ®) on aircambers 3 times daily for 7 days every two weeks for 3 months and supplementation with chondroitin sulfate and glycosaminoglycans. Although etiology is unknown, this condition may be associated with congenital defects or degenerative cartilage tracheal rings (chondrodysplasia, chondrodystrophy or chondromalacia). Tracheal stenosis can result from external compression by chronic infections of lungs-oesphagus, which differs from the main condition of this pathology.