

Highlights of recent clinically relevant papers

Reliability of URT endoscopic grading

This study by C.L. McGivney and colleagues in Ireland and Norway evaluated observer agreement in upper respiratory tract (URT) endoscopy for multiple URT disorders, during resting and overground endoscopy.

Endoscopy videos from 43 Thoroughbreds with URT disorders were evaluated in duplicate by four clinicians and graded according to previously defined scales. Intraobserver and interobserver reliability were statistically evaluated.

Perfect or near-perfect intraobserver agreement was found for arytenoid asymmetry at exercise, epiglottic retroversion and epiglottic entrapment. Substantial intraobserver agreement was seen for arytenoid asymmetry at rest, palatal dysfunction, medial deviation of aryepiglottic folds (MDAF), epiglottic grade at exercise and pharyngeal mucus. Moderate agreement was seen for vocal cord collapse, ventromedial luxation of apex of corniculate process of the arytenoid (VLAC), epiglottic grade at rest and nasopharyngeal collapse, overall suggesting that individual clinicians are consistent in their grading of URT conditions.

Interobserver agreement was lower. There was near-perfect agreement in intermittent dorsal displacement of soft palate (DDSP) and moderate agreement for grade B arytenoid asymmetry at exercise, grade 2 MDAF and grade 2 palatal dysfunction. Overall the results suggest that grading of these disorders is somewhat subjective and based on the clinician's opinion.

Intraobserver reliability in endoscopic evaluation of URT disorders is good; however, interobserver reliability could be improved by clinician training and more defined grading systems, especially for conditions of the epiglottis.

Nephrosplenic colonic entrapment

The objectives of this study by Brad Nelson and colleagues in the USA were to identify factors associated with short-term survival and time to death after hospital discharge in horses with nephrosplenic entrapment (NSE) and to compare the frequency of recurrent colic episodes in horses with and without laparoscopic closure of the nephrosplenic space.

Data including signalment, physical examination parameters, laboratory results, diagnostic findings and treatments were collected from medical records of horses treated for NSE over a 12-year period. Factors associated with short-term survival to discharge and time to death after hospital discharge were analysed.

During the study period, 211 horses had 231 NSE events and 192/211 (91%) horses survived to discharge. A positive difference in packed cell volume (PCV at admission–PCV after treatment) was associated with reduced odds of nonsurvival with each increment (OR 0.899) while the presence of concurrent alimentary lesions (OR 8.47) were significantly associated with increased odds of nonsurvival in the short term. Of 156 horses that survived to discharge for which follow-up was available, 152 (97%) were alive for ≥ 1 year. Increasing age (incremental years) at hospital admission was significantly associated with death after discharge (hazard ratio 1.078). Recurrence of NSE was recorded in 49/211 (23%) horses. The overall change in colic score indicated a reduction in colic in

horses following laparoscopic closure of the nephrosplenic space compared with horses that did not have closure of the nephrosplenic space.

An increase in PCV from admission to after treatment and concurrent abdominal lesions were associated with increased odds of nonsurvival to discharge in horses with NSE. Horses that underwent laparoscopic closure had reduced colic episodes compared with horses without laparoscopic closure.

Hoof balance radiographs

This study by Frederik Pauwels and colleagues in New Zealand investigated whether radiographic measurements of hoof balance are significantly influenced by a horse's stance.

Hoof balance radiographs are commonly used as the basis for corrective farriery decision-making in horses; however, published data quantifying effects of the stance of the horse or the horizontal radiographic beam angle are limited. This analytical study examined the influence of variation of the horse's stance in the craniocaudal and lateromedial plane on hoof balance measurements as well as the influence of variation of the horizontal radiographic beam angle on dorsopalmar hoof balance measurements.

Distal left thoracic limb lateromedial radiographs were acquired using a standardised protocol while varying the craniocaudal stance of five horses, each selected to be sound and conformationally normal. Dorsopalmar foot radiographs were acquired while varying the lateromedial stance; and variable angle horizontal beam dorsopalmar foot radiographs were acquired while keeping the limb position constant. Analyses of measurements demonstrated that hoof pastern angle had a linear relationship with craniocaudal stance of the horse. The relationship of joint angle and stance was greater for the distal interphalangeal joint angle than the proximal interphalangeal joint angle. The distal phalanx angle did not change with craniocaudal stance variation. The proximal interphalangeal joint width, distal interphalangeal joint width, or distal phalanx height did not change with lateromedial stance variation, nor within a 15 degree dorsolateral to caudomedial and dorsomedial to caudolateral variation from the dorsopalmar axis. These findings show that positioning of the thoracic limb should be considered during radiographic interpretation and decision-making for corrective farriery.

Equine coronavirus

This study by L. Kooijman and colleagues in the Netherlands and USA investigated the seroprevalence and risk factors for infection with equine coronavirus (ECoV) in healthy horses.

Seroprevalence data is needed to better understand the epidemiology of ECoV in adult horses, evaluate diagnostic modalities and develop preventive measures. This study investigated the seroprevalence and selective risk factors for ECoV in 5247 healthy adult horses in the USA, using a recently established and validated IgG enzyme-linked immunosorbent assay. Prevalence factors including geographic region, age, breed, sex and use were analysed.

A total of 504/5247 horses (9.6%) horses tested seropositive. Geographic region (Mid-West), breed (draught horses) and

specific uses of horses (ranch/farm and breeding use) were all statistically significant risk factors for seropositivity.

Novel immunotherapy for sweet itch

This study by S. Jonsdottir and colleagues in Iceland and Switzerland investigated a novel immunotherapy approach to Culicoides insect bite hypersensitivity (sweet itch).

Barley grain expressing hyaluronidase protein originating from *Culicoides* saliva was fed to four Icelandic horses (immunologically naïve to *Culicoides*) while three controls were fed normal barley. Horses were treated six times over a period of 20 weeks with 50–100 g of barley grain each time, up to 400 g in total. Eight months after the last treatment, horses were all 'boosted' with 100 g of barley. Blood and saliva were collected from the horses before and 2 weeks after each treatment and tested with an ELISA for IgG antibodies to two *Culicoides* proteins. After the transgenic barley treatment, three of four horses showed an IgG1 response and all four horses were successfully boosted, significantly different from controls. A competitive inhibition ELISA showed that after the boost, transgenic barley-treated horses' sera inhibited binding of IgE to one of the *Culicoides* proteins. A further competitive inhibition ELISA showed that the two proteins are not fully cross-reactive. These results show that the transgenic barley is effective at inducing an allergen-specific response and that antibodies produced are able to partially inhibit IgE binding to allergens from *Culicoides* species. Further study is warranted as an immunotherapy treatment for insect bite hypersensitivity.

Equine movement symmetry

This study by Line Greve and colleagues in the UK investigated thoracolumbar movement in sound horses trotting in straight lines in hand and on the lunge and the relationship with hindlimb symmetry or asymmetry.

Equine movement symmetry is changed when turning, which may induce alterations in thoracolumbosacral kinematics. This study documented thoracolumbar movement in 14 subjectively sound horses comparing straight lines with circles on both reins and related these observations to the objectively determined symmetry/asymmetry of hindlimb gait. The horses were trotted in straight lines and lunged on both reins and inertial sensor data collected at landmarks: withers, T13 and T18, L3, tubera sacrale, and left and right tubera coxae. Data were processed and angular motion range of motion (ROM; flexion-extension, axial rotation, lateral bending) and translational ROM (dorsoventral and lateral) and symmetry within each stride were assessed.

The dorsoventral movement of the back exhibited a sinusoidal pattern with two oscillations per stride. Circles induced greater asymmetry in dorsoventral movement within each stride (mean \pm s.d. up to $9 \pm 6\%$) compared with straight lines (up to $6 \pm 6\%$). The greatest amplitude of dorsoventral movement (119 ± 14 mm in straight lines vs. 126 ± 20 mm in circles) occurred at T13. Circles induced greater flexion-extension ROM ($>1.3^\circ$), lateral bending ($>16^\circ$), and lateral motion (>16 mm) compared with straight lines. Circles induced a movement pattern similar to an inside hindlimb lameness, which was significantly associated with the circle-induced greater asymmetry of dorsoventral movement of the thoracolumbar region. Moving in a circle induces measurable

changes in thoracolumbar movement compared with moving in straight lines, associated with alterations in the hindlimb gait.

Urethral rents following perineal urethrotomy

This retrospective case series by Kati Glass and colleagues in the USA studied male horses with urethral rents following perineal urethrotomy (PU) or corpus spongiosotomy (CS).

Data including signalment, clinical features, urethroscopic findings, surgical treatment, and outcome were recorded from medical records of 33 male horses (aged 3–18 years) examined because of haematuria or haemospermia caused by urethral rents that underwent PU or CS at a referral hospital over a 25-year period. Long-term follow-up information was obtained by telephone interviews.

Nineteen geldings and one stallion with haematuria were examined, of which 13 and 7 underwent PU and CS, respectively, at a mean of 56 days after onset of clinical signs. Thirteen stallions with haemospermia were examined, of which 7 and 6 underwent PU and CS, respectively, at a mean of 193 days after onset of clinical signs. Haematuria resolved following one surgical procedure in all 17 horses for which long-term information was available. Of the 12 stallions for which long-term information was available, seven had resolution of haemospermia after one PU or CS and five developed recurrent haemospermia that required additional PUs or CSs ($n = 3$) or primary closure of the urethral rent ($n = 2$).

Results indicated that PU and CS were reliable treatments for resolution of haematuria in male horses with urethral rents; stallions with urethral rents may require multiple PUs or CSs or primary closure of the rent for resolution of haemospermia.

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