15

A RETROSPECTIVE CASE SERIES OF THE INCIDENCE, TREATMENT AND OUTCOME OF EQUINE WOUNDS SEEN IN OUT-OF-HOURS PRIMARY CARE EQUINE PRACTICE IN THE UK

[1]J. R. Firth, [1]A. Bowden, [1]J.H. Burford, [2]T.S. Mair, [3]W. Furness and [1]S.L. Freeman
[1]*School of Veterinary Medicine and Science, University of Nottingham, College Road, Sutton Bonington, Loughborough, Leicestershire, UK;* [2]*Bell Equine Veterinary Clinic, Butchers Lane, Mereworth, Maidstone, UK;* [3]*Scarsdale Equine Practice, Markeaton Lane, Derby, UK.*
E-mail: svxab4@exmail.nottingham.ac.uk

Reasons for performing study: Wounds are a common reason for out-of-hours call outs in equine practice. There is currently a lack of evidence on the types of wound, treatments commonly used and the associated outcomes.

Objectives: To describe the incidence of different types of wounds seen in out-of-hours equine veterinary practice, their treatments and outcomes.

Study design: Retrospective case series.

Methods: Clinical data were reviewed from horses seen as out-of-hours primary care emergencies for wounds at two equine veterinary practices between 2011 and 2013. Wounds were categorised according to location and type. The incidence of different types of wounds, and the case presentation, treatment and outcome were analysed. Fisher's exact test was used to determine whether breed, degree of lameness and concurrent conditions were associated with outcome.

Results: Data was retrieved from 481 cases. 'Simple wounds' were the most common (n = 292), particularly involving the distal limb (n = 128). Simple wounds consisted of wounds that were not chronic, synovial, a foot penetration, or involving the head, neck or body. Synovial wounds had the highest proportion of complicated outcomes (82%, n = 14 of 17). There was a significant relationship between severity of lameness and outcome (P = 0.0003). Clinicians did not routinely record insurance status (34%, n = 164), descriptive wound location (58%, n = 280), cause (43%, n = 211) or lameness score (22%, n = 110). Based on this, and current veterinary and medical literature, a recording proforma for wound cases was created.

Conclusions: This first study of the incidence, treatments and outcome of wounds seen out of hours in UK equine practice highlighted that the majority of cases were simple limb wounds. Degree of lameness was significantly associated with outcome, and should be considered an important component of case recording. The use of a proforma may improve clinical recording within practice and assist with prospective clinical studies.

Ethical animal research: The study was approved by the Ethics Committee, School of Veterinary Medicine and Science, University of Nottingham. Explicit owner consent was not stated. **Source of funding:** A.B.'s PhD is funded by the School of Veterinary Medicine and Science. **Competing interests:** None declared.

16

VETERINARY INTERACTIONS: CONSIDERING THE EQUINE PERSPECTIVE

[1]C.A.L. Owen, [1]C.R. Quarmby and [1]A.L. Roshier
[1]*School of Veterinary Medicine and Science, University of Nottingham, Sutton Bonington, Loughborough, Leicestershire, UK.*
E-mail: svycao@exmail.nottingham.ac.uk or mandy.roshier@nottingham.ac.uk

Reasons for performing study: Equine well-being encompasses psychological and physical aspects and should be considered during veterinary interactions. Low-stress handling strategies facilitate positive encounters, in turn minimising injury to both animal and veterinarian. Factors to consider during each interaction include an understanding of the species, the individual animal and the handler's approach.

Objectives: The aim of this preliminary study was to explore the handling approaches of veterinarians, and vets in training, when interacting with horses.

Study design: Qualitative analysis of practical handling and interviews.

Methods: The study was guided by research questions relating to the considerations participants make during equine interactions, and what resources and training informs their approach. Twelve veterinary students (three male, nine female) and two female equine clinicians from Nottingham Vet School were each videoed interacting with a horse. This was followed by semi-structured interviews with participants including review of the video footage. Interviews were thematically analysed.

Results: Themes discussed included equine perception and emotional state, experiences of handling and restraint methods, awareness of species ethology, knowledge of the individual, safety and reflection on practice. Participants varied in their awareness and application of evidence-based research. Presenting videos during interviews provided a unique perspective from which participants reflected on their handling approaches.

Conclusions: Variation in knowledge of equine ethology and perception, and consequently its practical application, highlights the necessity to include this training in veterinary curricula. This training should be supported by incorporating the evolving evidence-based literature into handling strategies. The development of handling skills can be further enhanced by the use of video that provides a powerful tool to facilitate reflective practice. Potential benefits include minimising the incidence of horse-related injuries, improving the animal's welfare and enhancing the human–animal bond.

Ethical animal research: The study was approved by the University of Nottingham, School of Veterinary Medicine and Science research and ethics committee. Participants provided informed consent. **Source of funding:** University of Nottingham, School of Veterinary Medicine and Science. **Competing interests:** None declared.

17

SEROPREVALENCE AND RISK FACTORS FOR INFECTION WITH EQUINE CORONAVIRUS IN HEALTHY HORSES IN THE USA

[1]L.J. Kooijman, [1]K. James, [1]S.M. Mapes, [1]M.J.P. Theelen and [1]N. Pusterla
[1]*Department of Equine Sciences, Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands.*
E-mail: l.j.kooijman@uu.nl

Reasons for performing study: Equine coronavirus (ECoV) is considered an enteric pathogen of foals and has only recently been

associated with infections in adult horses. Seroprevalence data is needed to better understand the epidemiology of ECoV in adult horses, evaluate diagnostic modalities and develop preventive measures.

Objectives: To investigate 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 (ELISA).

Methods: The study population consisted of 5247 healthy horses from 18 states. Serum samples from these horses were tested for IgG to ECoV using an ELISA based on a recombinant protein containing two immunodominant areas of the spike protein of ECoV. Risk factors analysed in this study included geographic region, age, breed, sex and use. Univariate logistic regression of each prevalence factor was performed to determine the odds ratios associated with the various risk factors. Further, a mixed effects logistic regression model was developed to include significant risk factors and the random effects parameter of horses originating from the same farm. Statistical significance was set at $P<0.05$.

Results: A total of 504/5247 horses (9.6%) horses tested seropositive. Statistically significant risk factors for seropositivity were geographic region (Mid-West), breed (Draught horses) and specific uses of horses (ranch/farm and breeding use).

Conclusions: Almost 10% of the 5247 healthy horses in the USA test seropositive for ECoV. ECoV has been reported to cause outbreaks of fever, anorexia and lethargy in horses around the world, including Europe, with morbidity ranging from 20-80% and a mortality rate of 11%. Further research is needed to investigate prevalence and risk factors for ECoV in Europe. In the meantime, ECoV should be considered as a potential causative agent in adult horses presented with compatible symptoms.

Ethical animal research: The study complied with the institutional ethical guidelines of the School of Veterinary Medicine, University of California in Davis. **Source of funding:** The study was supported by the Center for Equine Health, School of Veterinary Medicine, University of California, Davis, with additional contributions from public and private donors. **Competing interests:** Zoetis USA supplied the equine sera used in this study. Zoetis USA played no role in the analysis and interpretation of data, or in the decision to submit manuscript for publication. None of the authors has any other financial or personal relationships that could inappropriately influence or bias the content of the paper.

18

GASTROENTEROLOGY

EARLY INDICATORS OF CRITICAL OUTCOMES IN HORSES PRESENTING WITH ABDOMINAL PAIN (COLIC): RETROSPECTIVE STUDY OF OUT-OF-HOURS FIRST-OPINION EMERGENCY CASES FROM TWO PRACTICES OVER A 3-YEAR PERIOD (2011–2013)

[1]A. Bowden, [1]G.C.W. England, [1]J.H. Burford, [2]T.S. Mair, [3]W. Furness and [1]S.L. Freeman
[1]School of Veterinary Medicine and Science, University of Nottingham, College Road, Sutton Bonington, Loughborough, Leicestershire, UK; [2]Bell Equine Veterinary Clinic, Butchers Lane, Mereworth, Maidstone, UK; [3]Scarsdale Equine Practice, Markeaton Lane, Derby, UK.
E-mail: adelle.bowden@nottingham.ac.uk

Reasons for performing study: There are limited data on the initial presentation and outcomes of horses with clinical signs of abdominal pain (colic).

Objectives: To identify clinical features that can be used as 'red flags' for critical cases of colic.

Study design: Retrospective case series.

Methods: Primary evaluation case records of all horses presenting as out-of-hours emergencies with clinical signs of colic at two equine veterinary practices were reviewed. Anonymised data from 2011 to 2013 were categorised according to whether case outcomes were 'critical' or 'not critical'. A 'critical' case was defined as an animal that required hospitalisation for medical or surgical treatment, or was euthanased or died. Univariable logistic regression was used to determine which aspects of signalment, history and presenting clinical signs including biologically plausible interaction terms were associated with a 'critical' outcome. Variables showing evidence of association ($P<0.2$) were further evaluated in a stepwise forward multivariable model to identify clinical presentations associated with critical outcomes.

Results: Data were retrieved from 941 cases that presented with signs of abdominal pain; 23.9% (n = 225/941) cases were categorised as 'critical', and 18% of all horses (n = 168/941) that presented with signs of colic were euthanased. Univariable logistic regression identified 15 variables with evidence of association to a critical outcome. The final multivariable model included three variables significantly associated with the likelihood of a case being classified as 'critical': increased heart rate (odds ratio (OR) 1.05, 95% confidence interval (CI) 1.03–1.08, $P<0.001$); abnormal mucous membrane colour (OR 5.40, 95% CI 2.86–10.20, $P<0.001$; and absence of borborygmi in at least one quadrant (OR 3.06, 95% CI 1.40–6.67, $P<0.01$).

Conclusions: This study identifies potential 'red flag' indicators of critical cases of colic on primary examination as increased heart rate, abnormal oral mucous membrane colour and absence of borborygmi in at least one abdominal quadrant on auscultation.

Ethical animal research: The study was approved by the Ethics Committee, School of Veterinary Medicine and Science, University of Nottingham. Explicit owner consent was not stated. **Source of funding:** A.B.'s studentship was funded by the School of Veterinary Medicine and Science, University of Nottingham. **Competing interests:** None declared.

19

CYTOKINE CONCENTRATIONS OVER TIME IN HORSES WITH ACUTE ABDOMINAL PAIN

[1]I. Johns, [2]F. Cunningham, [3]B. Wagner and [2]A. de Mestre
[1]B and W Equine Group, Breadstone, Berkeley, UK; [2]Royal Veterinary College, Hawkshead Lane, North Mymms, Hatfield, Hertfordshire, UK; [3]College of Veterinary Medicine, Cornell University, Ithaca, New York, USA.
E-mail: imogen.johns@bwequinevets.co.uk

Reasons for performing study: Colic is a leading cause of morbidity and mortality. Factors predictive of disease severity and outcome may help improve outcomes in patients. Inflammatory and anti-inflammatory cytokine concentrations may be predictive of disease severity and mortality in critically ill human patients, but it is unknown if these measurements are useful in horses with colic.

Objectives: To determine cytokine concentrations in horses with colic over time; determine whether those concentrations are predictive of disease severity and outcome.

Study design: Prospective clinical study.

Methods: Blood cytokine concentrations were determined in horses admitted to a referral hospital for colic. Samples were obtained at admission (D_0; n = 64), Day 1 (D_1; n = 43) and Day 3 (D_3; n = 27). Concentrations of interleukin (IL)-17, interferon (IFN)-γ, IL-4 and IL-10 and IFN-α (as control) were measured using bead-based multiplex assay and tumour necrosis factor (TNF-α) using enzyme-linked immunosorbent assay (ELISA). Horses were categorised based on survival, presence of SIRS, need for surgery and development of complications. Cytokine