



winter newsletter

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At this time of year, we naturally look back and give context to the events of the past 12 months. I started as Director of the Equine Hospital in December 2022 and am aware of what an absolute privilege it is. I am humbled by the colleagues and students I work with on a daily basis. It is these people who allow us to continue to function and adapt in this ever-changing landscape. Our objectives are simple and universal across universities: educate the next generation of vets, provide and disseminate clinical excellence, and engage in relevant and impactful research. However, these three cornerstones of our charter are not always easily achieved in unison. As specialisation becomes more prevalent and the expectations of clients and students rise, we have invested in our clinical services. Our diagnostic imaging services remain unparalleled and we have added a Hallmarq standing CT for distal limbs. All horses going for MRI will have a standing CT at no extra cost to the client.

We are also mindful of our commitment to our students. Our first opinion equine practice has invested heavily in experienced vets who know and understand the job and have the motivation to impart their knowledge and enthusiasm for the profession. Within the Hospital we look to facilitate the greatest teaching experience from every case. The quality and dedication of our students should not be underestimated, and we work hard to enthuse the next generation of veterinary practitioners. The contribution of you, our referring vets, is absolutely essential. Every clinical case you send us provides valuable learning experiences for our students and every EMS placement you provide gives unparalleled access to a resource that students in other countries can only dream about. For this we are extremely grateful and hope that we can continue to improve and meet your expectations as we move forward together.

Padraig Kelly, Director of the Dick Vet Equine Hospital

Atypical myopathy

Recently we have seen several cases of atypical myopathy in Scotland, associated with ingestion of sycamore seeds. Although the incidence of this disease varies from year to year, presumably due to climatic factors affecting toxin production in the seeds, most cases tend to occur from October to December, so it is worth keeping an eye out for suspect cases at this time of year.

Diagnosis

Cases often present as suspected colic or tying up. Key clinical signs include:

- Stiffness / weakness
- Lethargy / low head carriage
- Recumbency
- Muscle tremors
- Sweating
- Tachycardia (sometimes severe)
- Dark urine (myoglobinuria)
- Often with good appetite and faecal output (helping to differentiate from colic).

Pasture access with nearby sycamore trees, and a lack of an obvious association with exercise, will generally increase the suspicion of the disease. Severely elevated muscle enzymes will help to confirm diagnosis, and additional laboratory abnormalities might include high blood lactate and hyperlipidaemia, due to the severe impairment of metabolic functions caused by hypoglycin A, the principal toxin.

In cases that are not clear cut, a definitive diagnosis can be obtained by the detection of the toxin or its metabolite in whole blood or serum. Samples need to be submitted to the Royal Veterinary College (RVC).

The prognosis for these cases is guarded, but seems to have improved over recent years as awareness of the condition has grown – a recent study estimate a survival rate of 30-40 per cent.

One of the main factors that determines prognosis is whether a horse remains standing – other signs, such as tachycardia or severity of muscle enzyme elevation, don't seem to have a strong association with survival. It can therefore be worth trying to treat horses that can still stand – it can however be challenging and costly, and requires a committed owner.



The toxin found in sycamore seeds can cause atypical myopathy.

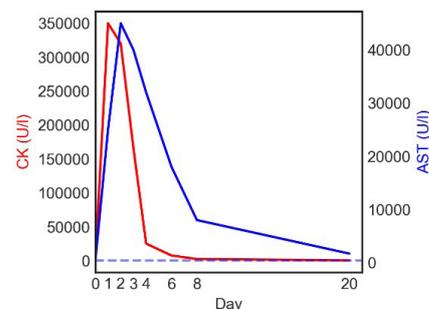
Treatment

Many cases may continue to worsen over the first couple of days of treatment. Key first aid measures include giving activated charcoal, which has been proven to bind the toxin. Providing suitable analgesia is key, though avoid non-steroidal anti-inflammatories if possible, as the horses are already at high risk of kidney injury from the myoglobinuria. Fluids and nutritional support may be required and injectable multivitamin supplements may be helpful – a statistical association has been reported between use of multivitamins and survival, and this could be plausible given the link with energy metabolism.

Prevention

Short of removing horses completely from pasture, and risking the gastrointestinal problems that could entail, it is difficult to eliminate the risk of exposure where there are sycamore trees around, especially after windy conditions. Strategies that can help include avoiding overgrazing, providing supplementary forage for grazing horses in the autumn and winter where appropriate, and fencing off areas closest to trees.

Particular care should be taken with young horses – it might be appropriate to stable temporarily in some circumstances, such as where high winds have led to extensive pasture contamination with sycamore seeds. You can now submit samples of seeds, seedlings or leaves to the RVC for testing, to see if they contain the toxin (see link below), although it is not always clear exactly how a given toxin concentration corresponds to disease risk.



Typical time course of creatine kinase (CK) and aspartate aminotransferase (AST) changes in a horse recovering from atypical myopathy. CK can rise to extreme levels within 24 hours, but can return close to normal within a week after onset. AST rises more slowly and has a much longer half-life, so can stay elevated for several weeks.

If you would like advice on a suspected atypical myopathy case, please contact the medicine service on 0131 650 6253, or email eqh@ed.ac.uk.

More information about the toxin tracing service offered by the RVC can be found here: <https://edin.ac/418h0rU>



Luna, a two-year-old who was recently treated in the hospital, survived this condition and is well on the road to recovery, now in a sycamore-free paddock

Pacemaker patient continues to thrive



Muffin Man's ECG in 2010 when first referred to the Hospital. Regular rhythm of 20 beats per minute with one unconducted P wave (2:1 AV Block) changing into 2 unconducted P waves (3:1 AV Block). Arrows indicate unconducted P waves.

One of our favourite patients came into the Hospital recently for a check-up. Muffin Man, a kind-natured 22-year-old gelding, had a transvenous pacemaker fitted by our team back in 2011, to control a very slow heart rate that was making him lethargic and reluctant to exercise. He came back to have the battery life on the pacemaker checked.

Muffin Man had been diagnosed with advanced second-degree atrioventricular (AV) block and only approximately 50 per cent of his P waves were conducted through the AV node to elicit a ventricular contraction. After failure to respond to medication, our team fitted a pacemaker lead into his right ventricle and attached it to a small generator device over his left pectoral muscle.

This pacing system was programmed to send impulses when the heart rate dropped below 40 beats per minute, to keep it at or above this level. We also activated a rate responsive mode on the system, which allowed the minimum heart rate to rise when Muffin Man moved his legs more.

This meant that he was able to increase his heart rate appropriately in response to exercise and trot, canter and so on, like a typical horse.

Following the placement, Muffin Man was back to his old self and resumed a very successful ridden and showing career. Although he is only ridden two or three times per week, Muffin Man is still happy to walk, trot and canter around the Borders countryside.

Examination of his pacemaker system showed that the battery still had at least 4-6 years of life left, so no action was required. If Muffin Man should need us to, we can easily replace this battery in future.

Pathological, or symptomatic, AV block is rare in horses. Pacemaker implantation, although requiring specialists to perform, is the only way of making sure a horse with this condition can have a long and happy life. As Muffin Man's case highlights, long term success of this procedure, including for ridden exercise, can be excellent.



Muffin Man, healthy at 22 years old, 12 years after his pacemaker implantation. (l-r) Christina Chesser (owner), Mags Pryde (pacing electrophysiologist), John Keen (DVE cardiology specialist) and Geoff Culshaw (HfSA cardiology specialist)

Meet our senior clinical teams

For case discussion or advice please contact any of the clinicians on **0131 650 6253** or email **EQH@ed.ac.uk**

Equine medicine



Nicholas Parkinson

Senior Lecturer in Equine Internal Medicine

Professor John Keen

Personal Chair of Equine Cardiovascular Medicine



Professor Bruce McGorum

Personal Chair of Equine Medicine

Professor Scott Pirie

Personal Chair of Equine Clinical Sciences



Equine behaviour



Gemma Pearson

Specialist in Equine Behavioural Medicine

Equine surgery and dentistry



Padraig Kelly

Director of the Equine Hospital and Practice

Senior Lecturer in Equine Surgery

Mattie McMaster

Head of Equine Surgery

Senior Lecturer in Equine Surgery



Sarah Taylor

Senior Lecturer in Equine Orthopaedics



Oliver James

Senior Lecturer in Equine Surgery

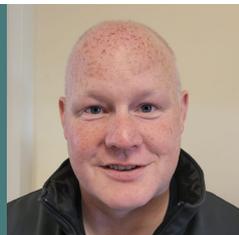


Rebekah Kennedy

Senior Lecturer in Equine Dentistry

Neil Townsend

Specialist in Equine Dentistry



Equine dermatology



Professor Tim Nuttall

Personal Chair in Veterinary Dermatology

Equine ophthalmology

Ben Blacklock

Head of Ophthalmology

Senior Lecturer in Veterinary Ophthalmology



Claudia Hartley

Senior Lecturer in Veterinary Ophthalmology



David Donaldson

Senior Lecturer in Veterinary Ophthalmology



Equine neurology



Caroline Hahn

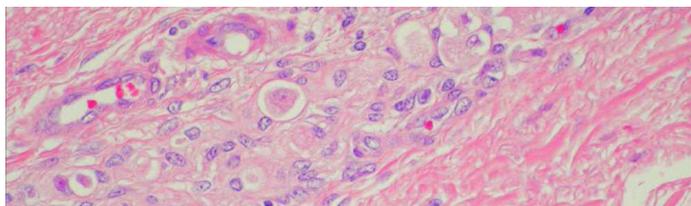
Senior Lecturer in Veterinary Clinical Neurosciences

Equine Grass Sickness update

HBLB-funded EGS multi-omics study

Professor Bruce McGorum, Professor Tom Wishart and Dr Dominic Kurian from the Roslin Institute have secured Horserace Betting Levy Board (HBLB) funding for a four-year clinical scholarship that will include a project investigating serum from horses with acute equine grass sickness (EGS).

Previous HBLB-funded research indicated that serum, or its protein fraction, collected from early cases of acute EGS could induce the neuropathology that characterises EGS. This work indicates that EGS is caused by an unidentified protein or protein-bound neurotoxin. This new project will use state-of-the-art laboratory techniques including proteomics, lipidomics and metabolomics to investigate, and hopefully identify, the causal toxin in EGS serum.



Chromatolytic neurons in submucosal plexus of horse with EGS (courtesy Prof Espeth Milne).

Elucidating the cause of EGS would clearly be a significant breakthrough, being a prerequisite to developing effective methods for controlling this devastating disease. The project will also identify key molecules that can inform the mechanisms underpinning EGS neurodegeneration, and serve as biomarkers to aid pre-mortem EGS diagnosis.

The project will include a focus on possible fungal toxins, given the long-held association between EGS and pasture fungi, and given our recent finding that a large number of fungal species are present in increased amounts in the gastrointestinal tracts of horses with EGS. Many of these fungi produce cytotoxic and/or neurotoxic metabolites which could potentially contribute to EGS aetiopathogenesis.

Read our latest paper on this subject:
<https://edin.ac/4a7O6fB>

Can the profile of volatile organic compounds aid diagnosis of EGS?

Professor Bruce McGorum and Dr Ben Langford from the UK Centre for Ecology & Hydrology have been awarded funding by the Equine Grass Sickness Fund to investigate whether the profile of volatile organic compounds (VOCs) in gastrointestinal contents can aid diagnosis of EGS, and/or inform its cause.

This study will test the hypothesis, based on many vets' and horse owners' anecdotal observations, that EGS horses have a characteristic odour, distinct from horses with other forms of colic. If this is correct, identification of the chemicals that cause this smell could potentially aid EGS diagnosis and inform its cause and underlying disease mechanisms.

The odour of EGS horses most likely reflects particular dietary or microbial-derived VOCs from the horses' gastrointestinal tract in their breath. VOCs comprise a large number of components that vaporise at body temperature. Many have detectable, characteristic odours. Exposure to some vapours can cause a variety of detrimental health effects.

In human medicine, there is interest in the assessment of human patients' VOC profiles to facilitate diagnosis of Parkinson's, Alzheimer's and other neurodegenerative diseases.

You can read more about the research here:

<https://edin.ac/3RsH91C> and here:

<https://edin.ac/41bNeCD>

EGS nurse support

We are delighted that the Equine Grass Sickness Fund has agreed to continue funding an EGS Nurse at the Royal (Dick) School for Veterinary Studies for a further year.

The EGS nurse plays a vital role in the day-to-day management of horses at the Dick Vet Equine Hospital, as well as providing telephone consultations with owners seeking advice on nursing horses at their own premises, and helping with collection of biological samples for research. The nurse can also give general advice on managing grass sickness cases, and refer owners to Dick Vet Equine Hospital clinicians for veterinary advice where appropriate.

For information about grass sickness please call the Dick Vet Equine Hospital on 0131 650 6253.



EGS is a debilitating and often fatal disease of horses, ponies and donkeys that affects the nervous system and the gut.

Vitamin D in racehorses



Researchers from the Dick Vet Equine Hospital and the Hong Kong Jockey Club Equine Welfare Research Foundation have demonstrated that Thoroughbred racehorses in Hong Kong require Vitamin D supplementation to mitigate the risk of low vitamin D status.

Vitamin D biology in equids is unique and poorly understood. Firstly, unlike humans, naturally managed grazing horses rely on dietary vitamin D2, ergocalciferol, to provide adequate vitamin D, because their endogenous ultraviolet radiation-mediated synthesis of vitamin D3, cholecalciferol, is ineffective.

Secondly, serum vitamin D values are, inexplicably, considerably lower than those for other species.

Thirdly, vitamin D appears to have a less important role in regulating calcium metabolism in horses than in humans, given that equine intestinal calcium

absorption is poorly regulated and urinary calcium excretion is very efficient.

This study assessed the vitamin D status of racehorses in training in Hong Kong, to test the hypothesis that the horses' management and athletic activity predispose them to having low vitamin D status, unless they have appropriate dietary supplementation.

Hong Kong horses are stabled with limited UVB exposure, have no access to grazing and are fed restricted amounts of forage and commercial feed containing various amounts of supplemental D3.

The horses undergo strenuous athletic activity, which has been reported to reduce vitamin D metabolites in healthy horses. Additionally, reductions in serum 25OHD concentrations, an index of vitamin D status, have been reported in horses with inflammatory diseases, including mild to moderate equine asthma, which is

prevalent in racehorses.

The study compared the vitamin D status of non-grazing Thoroughbred racehorses in Hong Kong and grazing Thoroughbred racehorses in the UK.

Hong Kong horses had lower serum concentrations of 25OHD2 and total vitamin D, reflecting reduced dietary vitamin D2 intake. These figures indicate that Hong Kong racehorses required dietary vitamin D3 supplementation to maintain adequate vitamin D status.

The inverse relationship between the serum concentrations of 25OHD2 and 25OHD3, previously identified in humans, was observed for the first time in horses, indicating that further study is needed to determine the optimal form of dietary vitamin D supplementation – that is, D2 or D3 – for Thoroughbred racehorses.

You can view the full research paper here: <https://edin.ac/4a5fHhH>

CPD events for referring vets

We will be continuing our popular in-person CPD evenings throughout 2024, with each session covering a different theme. All four events are **free** to attend and open to all our referring vet colleagues.

For more information or to book your place at any of these events visit www.ed.ac.uk/vet/equineCPD

The Mare & Foal

23 January 2024

The Acute Horse

19 June 2024

The Geriatric Horse

8 October 2024

The Young Horse

3 December 2024

Other CPD events we are hosting

Equine Lameness and Poor Performance in conjunction with Eickemeyer

12-13 March 2024

Colic Surgery for the Colic Surgeon in conjunction with BEVA

8-9 July 2024