Epidemiology of **Equine Laminitis:** why should you CARE about laminitis?

By Claire Wylie MRCVS

What is epidemiology?

Epidemiology is a branch of veterinary science that studies the health status of populations, rather than individual animals.
Epidemiologists are interested in investigating whether there are identifiable patterns of diseases within animal populations by looking at the type of animals affected, their location, and how diseases change over time.
At the International Conference on Equine Laminitis and Diseases of the Foot in 2009, a panel of veterinarians, farriers and researchers identified epidemiology as the next key step in conquering equine laminitis.

What is laminitis?

Laminitis is one of the most devastating and debilitating diseases affecting horses and ponies today. It is of particular significance because it poses a threat to all horses and ponies – regardless of how well they are cared for.
Laminitis is a complex disease that occurs when the lamellae (also known as laminae) inside the foot undergo degenerative changes.

There are thought to be three types of disease process which result in laminitis:

1. Excessive mechanical overload or trauma
This type of laminitis may occur following direct trauma to the hoof, extensive concussive work or prolonged weight-bearing following unilateral lameness.

2. Systemic inflammatory response syndrome ('SIRS')
Similar to human organ failure, this type of laminitis may occur following carbohydrate overload (gorging on concentrate feedstuffs) and inflammatory diseases such as colic, diarrhoea and retention of the placenta after foaling.

3. Endocrinopathic disorders
Laminitis occurring with obesity, pituitary *pars intermedia* dysfunction 'PPID' (more commonly known as 'Equine Cushing's disease'), insulin dysregulation such as Equine Metabolic Syndrome 'EMS', and following steroid use has been termed "endocrinopathic laminitis".

How common is laminitis?

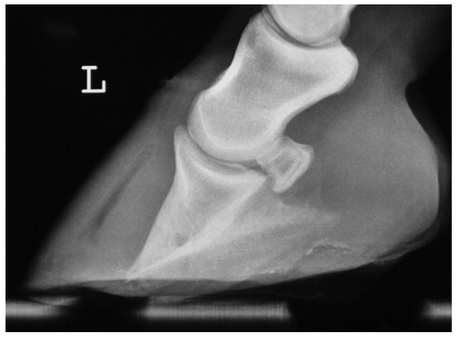
It is difficult to estimate accurately how common laminitis is overall; estimates have ranged from between 1.5% to 34.0% of the population investigated. Specific subsets of laminitis may occur only rarely; a study just published by Rossdales Equine Hospital and Diagnostic Centre found only 11 cases of laminitis considered to be due to excessive mechanical overload in the past nine years.
The most recent epidemiological study in Great Britain was a World Horse Welfare (WHW) funded project conducted with the Animal Health Trust (AHT) and Royal Veterinary College (RVC). This study found that active, clinically apparent laminitis occurred in nearly 1 in 200 veterinary-registered horses/ponies, and accounted for nearly 1 in 200 first-opinion equine veterinary visits.
Whilst it is very important that a correct diagnosis and classification of disease is made by a suitably qualified person before any treatment is initiated, it is likely that laminitis is not always attended by a vet and is therefore more common in the general equine population than this study found.
The National Equine Health survey, run by The Blue Cross, collected data from 11,002 horses across the United Kingdom in May 2014. Worryingly, owners reported that 7.1% of horses and ponies had laminitis, compared with 4.4% the year before, and more laminitis cases were recorded as first episodes (43.0%) than the year before (23.0%).
We need more epidemiological studies to determine whether laminitis is affecting more horses and ponies throughout the country, or whether there has been an increased awareness of the disease that could be responsible for owners noticing new cases more efficiently.

This pony is showing clinical signs of acute laminitis, predominantly in the forefeet. Leaning back in this classical 'laminitis stance' is thought to relieve pain by reducing the amount of weight being distributed through the painful lamellae at the front of the hoof wall. Image courtesy of WHW.

Why do some horses develop laminitis and others don't?

In order to decrease the frequency of laminitis, it is important to understand the features that make some horses more or less likely to develop laminitis. Two studies in Great Britain have gathered this type of information recently, as summarised in ***Table 1*** above right.
The best way to prevent laminitis occurring in the first instance is to prevent, where possible, the underlying disease processes previously mentioned. It is becoming increasingly apparent that endocrinopathic disorders may be responsible for the majority of laminitis cases and there is good evidence that their control can reduce the risk of laminitis. If you suspect your horse or pony has an endocrinopathic disease, please seek veterinary advice.
Laminitis tends to recur in previously affected animals; therefore if your horse or pony has had a previous episode of laminitis you should be aware of the need for ongoing collaborative foot management with your vet and farrier. While an apparent association between shoeing/trimming and laminitis may be a direct result of poor shoeing or trimming in certain cases, it also may be suggestive of early clinical signs of laminitis. If therefore your horse or pony does appear to be lame or foot-sore after shoeing or trimming, make sure you seek advice from your vet and/or farrier.

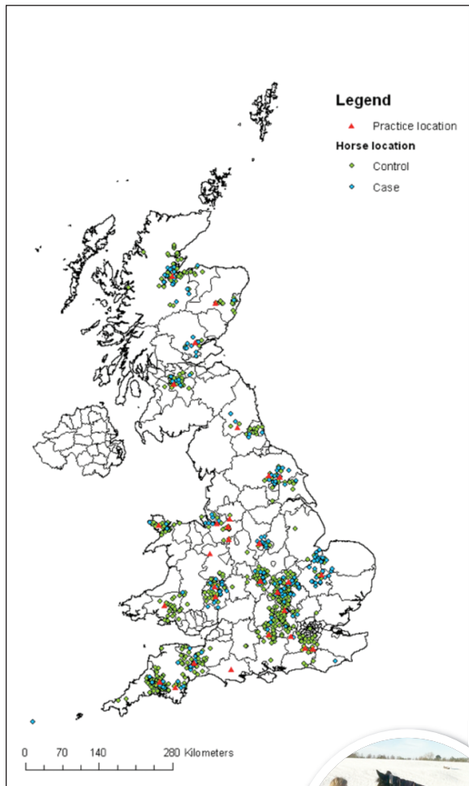
Divergent growth rings (rings that are narrow at the toe, becoming wider as they reach the heel) are a sign of chronic laminitis. Other chronic laminitic changes to the hoof include: altered foot shape; changes in the hoof angle; sole bruising; widening of the white line and a palpable depression of the coronary band.



This radiographic image shows a horse with chronic laminitis. The lamellae that normally act to attach the pedal bone (the triangular bone at the bottom of the skeletal limb) to the hoof capsule have undergone such extensive degenerative changes that the bone is no longer being held parallel to the hoof wall but has rotated and sunk towards the ground.

Table 1: Evidence for factors that make laminitis more or less likely in Great Britain

Factors associated with laminitis	RVC study of rescue animals on East Anglian farm between 1997-2000, and 2005-2008, using veterinary-diagnosed cases	WHW-funded AHT-RVC study between 2009 and 2011, using veterinary-diagnosed cases with owner-reported questionnaires
Season	Increasing sunshine corresponded with increased laminitis frequency, with most cases in May	Increased risk in the summer and winter, compared to spring
Sex	Increased risk in mares compared to geldings	No association with sex identified
Height	No association with height identified	Increased risk in smaller animals
Box rest	Not studied	Increased risk with box rest in the previous week
Endocrine disease	Not studied	Increased risk with endocrinopathic disease history (PPID or EMS)
Grazing	Not studied	Increased risk with new access to grass within the past four weeks compared to those with no access, or access for a longer duration
Previous laminitis	Not studied	Increased risk with previous episodes of laminitis
Shoeing/trimming	Not studied	Increased risk if owner considered animal lame or foot-sore after shoeing or trimming
Supplementation of regular feeding	Not studied	Reduced risk with feeding of supplements compared to those not fed supplements
Transportation	Not studied	Reduced risk if transported in the previous week
Weight gain	Not studied	Increased risk with increased bodyweight in the past three months
Worming	Not studied	Increased risk with an increasing time since last worming



Epidemiological studies require co-operation. This map shows the location of 30 vet practices (red triangle), and over 1000 owners who completed a questionnaire for a horse or pony with laminitis (blue dot), or without laminitis (green dot) helping with the AHT-RVC study.

How does this information help you manage your horse?

Some of the previously identified factors are classed as "non-modifiable", meaning that they cannot be influenced directly – no amount of stretching will increase the height of your Shetland pony! However such information helps identify groups of animals for which efforts to prevent equine laminitis should be considered of particular importance.
Especially important at this time of year, is the strong evidence showing that laminitis is not just a disease of the springtime. In fact, laminitis may be even more likely to occur in the other seasons, particularly if owners fail to implement appropriate preventive strategies when they think their horse or pony is 'safe'. Several of the recently identified factors do present possible preventive opportunities, as listed below:

- Make all feed changes gradually – including access to new grazing. Be aware that recent research has found that even if ponies are turned out for only a few hours they are able to consume almost half their daily dry matter intake by gorging on the grass when it is made available to them! Grazing muzzles are an effective way of restricting grazing in a natural environment.
- Try to prevent your animal gaining weight over a relatively short period of time. Regular measurement of your animal's weight will ensure that they are receiving adequate energy supply. Research has found that soaking hay for a prolonged period of time, in the right

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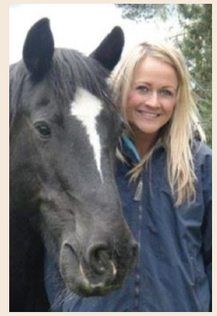
Laminitis is not just a disease of the springtime! The most recent epidemiological study by the AHT-RVC found a peak of laminitis occurred in January 2010, when there was exceptionally poor weather reducing access to grass to almost zero in many parts of GB. Be vigilant for cases of laminitis occurring all year round!

Vet Profile



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Year of Qualification: 2004
Claire joined the team at Rossdales Equine Hospital and Diagnostic Centre in October 2013. She is the Resident in Equine Clinical Research, a position fully funded by The Margaret Giffen Trust.
Claire graduated from the University of Edinburgh in 2004 and subsequently studied for an MSc in Equine Science from the University of Wales, Aberystwyth. For the research part of this degree she returned to Edinburgh to conduct an epidemiological study of equine grass sickness (EGS). Following this she joined the Animal Health Trust's Centre for Preventive Medicine, where she helped to develop the first nationwide surveillance scheme for EGS, as a precursor to the current vaccine trial. In 2008 Claire commenced her PhD on the epidemiology of equine laminitis in conjunction with the AHT and the RVC, which was generously funded by World Horse Welfare. Claire's PhD investigated the frequency of, and risk factors for, equine laminitis in Great Britain, with the help of collaborating veterinary practices in England, Scotland and Wales and the owners of horses and ponies with and without the disease. Upon completion of her PhD Claire spent a year working at the University Autonoma in Barcelona – on a European Food Safety Authority tender reviewing the literature regarding effective control measures for a disease spread between dogs, sand flies, and humans. Claire is part of the Care About Laminitis study team, a team of veterinary epidemiologists and laminitis researchers hoping to help in the quest to conquer laminitis.

Vetwatch

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amount of water, reduces the amounts of available carbohydrates.

- If you horse is ill or injured, follow your vet's advice to ensure an appropriate plane of exercise can be maintained whilst on box rest.

There were also a couple of unexpected and interesting findings in the most recent research that require further investigation before any recommendations can be made.

Firstly, animals that had been recently transported were less likely to develop laminitis. We certainly don't recommend that a trailer ride round the block will prevent laminitis, further investigation will explore whether this was a 'false' effect that may have been identifying fit, healthy, middle-aged animals – in human studies this is known as a 'healthy worker effect'.

Secondly, there was an increasing risk of laminitis with an increasing time since the animal was last wormed, which may reflect gut damage, or improved general health management.

Further work to explore this finding is currently underway and is necessary before any recommendations on worming management can be made.

A large epidemiological study of laminitis that you can take part in has just been launched across England, Scotland and Wales. This World Horse Welfare (WHW) study is being run by the AHT and RVC in collaboration with Murdoch University and Rossdales Equine Hospital. You can register at www.careaboutlaminitis.org.uk.

Why should you CARE about laminitis?

The study of diseases in populations is greatly enhanced by co-operation from the population you are trying to study! Currently horse owners have a chance to be actively involved with a ground-breaking epidemiological study in Great Britain.

'CARE about laminitis' is a new project that is working with horse owners and vets to gather further epidemiological information. Following a period of piloting at Rossdales Equine Hospital, vets at Rossdales Equine Practice, and other vets across the country, have been helping to validate owner-reported data since the start of the year.

The recently launched dedicated study website aims to recruit a large number of horse and pony owners throughout England, Scotland and Wales.

For this study to be a success it is extremely important that both animals that will and will not develop laminitis participate in the project. Because any horse or pony can develop laminitis in their lifetime it is important that you do care about laminitis, even if your horse or pony has never had it.

If you take part in this study, you will be asked to complete a baseline questionnaire providing general information about your horse or pony as well as health and medical history; and your current management practices. A monthly follow-up questionnaire will detail if any of the information originally submitted has changed. Researchers will then analyse the information to produce evidence-based guidelines to help reduce the frequency of laminitis in the future.

To take part in Care About Laminitis visit www.careaboutlaminitis.org.uk or contact the PhD student responsible for the project, Mrs Dee Pollard, at the Animal Health Trust via dpollard@aht.org.uk or 01638 751000 (Ext: 1506).