Article of the month – Equine Grass Sickness

What is Equine Grass Sickness?

As the name suggests, EGS is almost exclusively a disease of **grazing horses**. Cases of EGS are reported to occur throughout Britain, with an increased risk of further cases on affected premises (Fig 1).

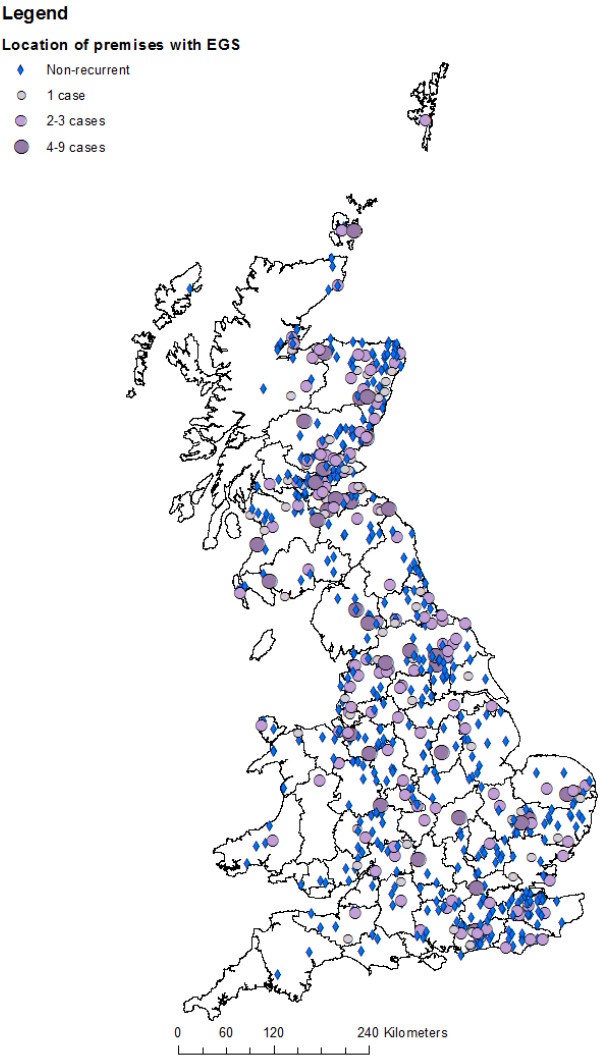

Fig 1. The incidence of EGS remains highest in Scotland, where the disease was first recognised, and cases also occur more frequently in eastern counties of England.

Non-recurrent relates to single cases reported to the EGS surveillance scheme from premises with no previous history of EGS.

Number of cases reported to the EGS surveillance scheme from premises with a known history of previous EGS cases.

The disease causes degeneration of neurons (nerves) in both the central and peripheral nervous systems. The gastrointestinal tract is particularly affected due to deterioration of the enteric neurons, which control the function of the gastrointestinal tract, although some of the signs of the disease are related to nerve damage in other parts of the body. EGS can occur in acute (less than two days), subacute (two to seven days), and chronic (more than seven days) forms, with the extent of damage to the neurons determining the severity and duration of the disease.

Diagnosis of EGS can be challenging and is based on the identification of risk factors and clinical signs, however these are wide ranging and vary from case to case. The clinical signs of acute EGS are **severe**, **appear suddenly**, and may include **depression**, **colic**, **excessive salivation** (Fig 2), **difficulty swallowing** or **inappetance**.

Fig 2 Case of acute EGS case showing drooling of saliva (Photo courtesy of Professor Chris Proudman, University of Surrey).

Clinical signs of subacute EGS are very similar but less severe. Unfortunately, recovery from either of these two forms of EGS is invariably not possible and definitive diagnosis can only be obtained by examining microscopic changes to the ileum (part of the small intestine) post-mortem. Approximately one-third of all EGS cases present with the chronic form, which has a more gradual onset of clinical signs, most notably profound weight loss. Chronic EGS cases may also develop a "**tucked up**" abdominal appearance and an abnormal stance (Fig 3). Although there is no specific treatment, with intensive nursing recovery may be possible in over 50% of horses with chronic EGS, depending on the severity of clinical signs. Further information about the clinical signs of EGS can be found on the Equine Grass Sickness Surveillance Scheme website.

Fig 3. Case of chronic EGS case showing depression, abnormal stance and extreme weight loss leading to a "wasp waist" appearance (photo courtesy of EGS Surveillance Scheme).

Risk factors

The study and identification of risk factors has provided valuable information with regard to improving diagnosis and management strategies for EGS. A large number have been identified and it is thought a combination of these factors contribute towards causing the disease.

Horse related risk factors

Although horses of all ages are susceptible to EGS it has been well documented that horses **between two and seven years** of age are at greatest risk, while reports of disease in older horses are less common and in very young horses are rare. Horses in **good to overweight body condition** have been identified as being at **greater risk** while **horses in contact with cases of EGS** have been reported to be ten times **less likely** to suffer from the disease, suggesting some kind of **acquired immunity**.

Management related risks

Factors associated with **increased risk** include:

- Recent movement to new premises or pasture
- Pasture disturbance due to construction work
- Mechanical removal of droppings and harrowing
- Dietary changes
- Frequent use of anthelmintics (wormers), in particular repeated use of Ivermectin
- Previous occurrence of EGS on a premises
- Premises with a large number of horses i.e. livery yards

Factors associated with **decreased risk** include:

- Regular grass cutting
- Manual faeces removal
- Stabling horses for part of the day and/or providing supplementary forage in the field during high risk periods
- Keeping stress to a minimum and making any changes to diet or pasture gradually
- Co-grazing with ruminants

Fig 4. Grazing with ruminants such as cattle and stabling and/or providing supplementary forage to grazing horses during high risk periods could help reduce the risk.

Seasonal, climate and soil related risk factors

EGS can occur throughout the year however there is a significant peak during the **spring and early summer months** with the greatest number of cases in May. Due to this seasonality, climate has been investigated as a risk factor and studies have indicated cases may be **more likely** to occur during periods of **cool dry weather** with temperatures between **7 and 11°C**. **Chalk soil** has been associated with a **decreased risk** of reoccurrence compared to clay, sand and loam soils while an increased level of **nitrogen in soil** has also been proposed as a **risk factor** for the disease.

Obviously it is not possible to control all of these factors, however where possible efforts should be made to modify the management of horses on high risk premises or during high risk periods with the aim of minimising exposure to risk factors. To read more about risk factors, click here.

Cause and possible protection

Early studies focused on numerous infective or toxic agents, including toxic plants, fungi, chemicals, mineral and vitamin deficiencies, insects, viruses and bacterial toxins; however, no consistent associations with the disease were demonstrated. The current theory is horses are exposed to some form of **noxious agent** present in the soil and ingested as a contaminant of grass.

In 1923 it was first suggested that there was a connection between EGS and the **bacteria** *Clostridium botulinum* (*C. botulinum*), due to the nature of damage to the nervous system and the similarity of clinical signs with the disease botulism in both horses and humans. This theory was recently further supported by the presence of high levels of *C. botulinum* in the intestinal contents and faeces of horses diagnosed with EGS compared to non EGS cases. *C. botulinum* bacteria are **found commonly in soil** and are capable of producing a range of **toxins**, including potent neurotoxins (toxins that damage the nervous system) to which horses are particularly sensitive. Classical botulism is a highly fatal neuromuscular disease caused when pre-formed neurotoxin is ingested via contaminated water or feed such as spoiled silage. In contrast, the current theory is that EGS is a **toxico-infectious form of botulism** caused by *C. botulinum* type C. The disease is thought to occur when a combination of risk factors triggers the production of neurotoxin locally in the horse's intestinal tract, causing damage to neurons and abnormal gastrointestinal tract function.

It has been identified that horses with EGS have lower antibody levels to *C. botulinum* type C and those with higher antibody levels have a reduced risk of disease, suggesting some form of acquired immunity and a potential protective role of antibodies against *C. botulinum* type C toxin. This evidence supporting **protective immunity** has paved the way for the **nationwide vaccine trial** which is currently underway. The hope is that EGS can be prevented by vaccination in a similar way to other clostridial diseases such as tetanus and botulism.

How can you help?

The highest risk season for EGS is spring and early summer, with 60% of EGS cases occurring during April – June. For the EGS vaccine trial to be a success, we are counting on the support of owners who have experienced the devastating effects of this disease first-hand. With the vaccine trial now in its second year, the Animal Health Trust is appealing to owners who keep their horses or ponies on premises that have had at least one case of EGS in the past three years to enrol and provide an invaluable contribution to this pioneering research.

If you would like to find out whether you might be eligible to take part, please visit the EGS vaccine trial website http://www.aht.org.uk/cms-display/egs_vt.html where you can find the owner information pack, and some helpful FAQs.

If you would like more details, or would like to enrol your horse or pony, please contact the EGS Vaccine Trial Team:
Tel: 01638 555399 or Email: equinegrasssickness@aht.org.uk

Article written by:

Becky Walker

Becky Walker is the newest member of the EGS vaccine trial team. Becky has had a passion for horses from a young age and went on to study Equine Science at Nottingham Trent University.

Dr Jo Ireland BVMS PhD Cert AVP(EM) MRCVS

Jo is currently heading the Equine Grass Sickness vaccine trial at the Animal Health Trust.