Pasture Associated Stringhalt: What's changed other than the name?

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Points in brief

• Pasture Associated Stringhalt (PSH) occurs following a dry summer period as has been seen recently
• Horses on dry quality, poor pastures containing the flatweed *Hypochoeris radicata* (Catsear, False Dandelion) are more susceptible to developing PSH.
• This weed has been demonstrated to produce neurotoxins in mice
• There has been no evidence of myco (fungal) toxins hence the use of mycotoxin binders for prevention has little current scientific basis
• Pathological findings are consistent with damage to the longer nerves of horses including those supplying the extensor muscles of the hind limbs
• Most horses spontaneously recover once removed from the offending pasture within 6-18 months
• Treatments including Phenytoin and/or surgery to cut the lateral digital extensor tendon may help severely affected horses walk
• Reports of dietary supplements that may have beneficial effects on the nervous system include Vitamins B1 (Thiamine) C and E, Taurine, Tryptophan and Magnesium

Introduction

Over the last few months there have been regular reports of horses suffering from Stringhalt in South Eastern Australia. Typically, the pasture associated form of (PSH, or Australian) Stringhalt occurs following a dry summer period as has recently been the case.

Although the clinical presentation is easily recognised (Figure 1), there are many unanswered questions about this rather striking affliction of horses. Dr W.T. Kendall in Victoria, back in the 1880’s rather amazingly recognised that some horses on dry quality, poor pastures containing the flatweed *Hypochoeris radicata* (Catsear, False Dandelion - see Figure 2) would suffer from the condition whilst others remained normal. Since then, researchers have tried, but only partially succeeded to; reproduce the condition, identify a toxin, explain the pathophysiology and successfully treat the condition.

The following is a brief review of the PSH previously referred to as Australian or Bilateral stringhalt and recent developments in identifying causes and common treatments. A distinction should be made between this form, and acquired unilateral or “classical” Stringhalt that may occur following injury and resultant scarring of the proximo-dorsal metatarsal structures.

Clinical signs

The gait of affected horses is characterised by excessive and prolonged hyperflexion of the tarsus that often results in the fetlock contacting the ventral abdomen when attempting to move. It is considered the result of excessive muscular contraction and recently described as equine reflex hypertonia. In chronic cases atrophy

![Figure 1. Classic gait of a horses affected with Stringhalt, demonstrating hyperflexion of tarsus.](image1)

![Figure 2. *Hypochoeris radicata* in a paddock with horses affected with PSH note presence of dry pasture litter material, and lack of improved pasture species.](image2)
of hindlimb muscles supplied by affected nerves may be severe and involves the lateral and long digital extensor, gastrocnemius and cranial tibial muscles. Some horses may vocalise abnormally due to degeneration of the left recurrent laryngeal nerve on the larynx. Behavioural changes have also been noted.

**Cause**

Researchers in the mid to late 20th century considered a mycotoxic (fungal) cause to be likely, given the association with climatic and pasture conditions, however several studies investigating the presence of fungal toxins since then have found no evidence of mycotoxins in incriminated pastures. A consistent feature of most outbreaks worldwide is the presence of *Hypochoeris radicata*. Although this weed is present in most reported cases, it should be noted that many horses graze pastures containing this weed without any apparent problems. Hence it appears that the presence of *Hypochoeris radicata* in addition to risk factors associated with climate, soil/pasture type and age / size of grazing horses are necessary to produce PSH in horses (Figure 3).

**Pathophysiology**

A peripheral neuropathy characterised by axonal degeneration of the longer, large diameter neuronal fibres within the tibial, deep and superficial peroneal and recurrent laryngeal nerves are consistently reported in horses affected with PSH. Affected nerves are the longer larger diameter ones not only supplying muscles but also those that are part of the myotatic reflex and synapse with inhibitory interneurons within the spinal cord. Dysfunction of these relays could lead to dis-inhibition of the flexor muscles with resulting hypertonicity and hyperreflexia that is obvious in cases of PSH.

**Management and treatment strategies**

The success of any treatment or management programmes for horses with PSH needs to be assessed in the context of the spontaneous recovery that generally occurs following removal of affected animals from the associated pasture. Although the vast majority of horses recover in 6 to 18 months, mildly affected horses can have shortened recoveries of between 1- 6 months. Severely affected horses may require over 2 years to recover completely and a small number of severely affected horses are euthanized for humane reasons often related to severe muscle wastage and/or weakness.

**Myotenectomy of the lateral digital extensor**

Surgery for stringhalt has been reported for over 300 years and the myotenectomy technique has wavered in popularity. Recent reports have indicated promising outcomes in horses with PSH. Although some affected horses have been reported to improve several grades immediately following lateral digital extensor myotenectomy, other horses have been reported to have improved after a prolonged convalescence leading some workers to be sceptical of the real benefit.

**Muscle relaxants**

In an attempt to relieve the muscular hypertonicity, several therapeutic agents have been used with mixed success, they include mephenesin, baclofen but most commonly, Phenytin. Phenytin acts to stabilise nerve cell membranes through its action as a sodium channel blocker, and has been administered to horses with PSH at 15 mg/kg once or twice a day PO to horses for several weeks. There is often some improvement during the treatment period that may continue to some degree following cessation of treatment.
Interesting recent reports of Botulinum toxin type A (Botox A) infiltration of the digital extensor muscles have demonstrated some improvement for 2-3 months in horses with Stringhalt (see references for details)

**Vitamins and antioxidants**

Thiamine (Vitamin B1) has been reported for use in horses with PSH. It is commonly used to treat peripheral neuropathies in humans and supplements containing thiamine are marketed as neuromodulating or calming agents for horses. Horses with PSH are often supplemented with Thiamine and other agents with purported neuromodulating effects in horses including L-Tryptophan and Magnesium. It has been postulated that such agents may be used to relax affected horses in the hope of reducing the clinical effects of PSH

Horses with PSH have been reported to be supplemented with a variety of anti-oxidant therapies including Vitamins C and E in an attempt to reduce oxidative damage to affected nerves and assist healing. Recent reports of the anti-oxidant agent, Taurine, were encouraging following its use in a large reported outbreak in Southern France. At a dose of 10 gm once a day PO Taurine was reputed to calm affected horses and assist in their management.

Other supplements anecdotally reported to be of benefit have little scientific basis however they include; mycotoxin binders, Dolomite and herbal preparations. As stated earlier, all treatments need to be viewed in the light of spontaneous recovery. There is little doubt that removing the horse(s) from affected pastures, keeping then in a calm stable environment and supplementary feeding with a balanced ration should enable recovery in most cases.

**Summary**

Prevention of this debilitating condition is vital. Improving pastures or at least avoiding those that have obvious risk factors during summer periods remains a priority. This is particularly relevant as our climate seems to be coming more conducive to producing the dry conditions that potentiate pasture-associated Stringhalt.

**References**


