CHARACTERISTICS OF ORTHOPAEDIC PROBLEMS IN ENDURANCE HORSES

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Annamaria Nagy looks at the causes of lameness in these horses and explains why further investigation is important in cases of transient lameness.

ENDURANCE is the fastest growing Fédération Équestre International (FEI) discipline. Between 1994 and 2010, the number of FEI endurance events increased from 16 to 277, and it is popular in the uK, with 6,043 ride starts in 2010.

At competitive endurance events, horses compete over distances of 40km to 160km. The total ride is divided into loops and after each loop there is a compulsory rest period.

Horses are examined by veterinarians before and throughout the competition (after each loop) and are eliminated if their metabolic status or orthopaedic condition is not considered to be adequate to enable them to continue the ride (fit to continue).

The endurance discipline is unique in that horses can be eliminated for the above reasons before or during the ride, and also at the final veterinary examination after completing the ride. Horses are eliminated for lameness, by definition, if they have “consistently irregular gait” (FEI rules, 2009).

Lameness is the most common reason for elimination worldwide (Nagy et al, 2010). Preliminary results of a largescale study analysing more than 22,000 horse starts in 43 countries, suggests that approximately 30 per cent of all horses starting at endurance rides of 100km to 160km distance between 2008 and 2010 were eliminated for lameness (Nagy et al, unpublished data). The high
elimination rate raises questions about the welfare of endurance horses, but it has to be borne in mind that the reason for eliminating horses is to prevent them from developing potentially severe injuries.

There are some characteristics of lameness in endurance horses that can make investigation challenging. The lameness is often transient, may only appear after a long distance (for example, 80km to 100km) and be present only for a few days or for even less than 24 hours.

If the horse is turned away without further investigation, lameness may only recur when the horse does the next ride, leading to the frustration of getting eliminated for the same reason. While other disciplines can be “mimicked” during lameness investigation – for example, a dressage test or jumping – in most circumstances it is not possible to train the horse for long distances so a veterinary surgeon can start his or her investigation. It is therefore important to alert riders that if a horse goes lame in training or is eliminated for lameness and is still lame the day after the ride, veterinary advice should be sought as soon as possible.

Under special circumstances, when there are treatment veterinarians at the ride or there is a team or private vet working for the rider, a preliminary lameness investigation can be performed at the venue. However, at most endurance rides there is not enough time or available personnel for investigation, other than to rule out severe injuries and obvious foot-related problems. If horses are examined shortly after the ride, it is important that the veterinary surgeon is familiar with clinical signs presented after a long distance, which in most cases are not associated with lameness and lesions.

Most horses show exaggerated reaction when the suspensory ligaments in the forelimbs are palpated and there is usually a variable degree of diffuse swelling in the palmar (and, less frequently, plantar) aspect of the metacarpal/metatarsal regions with or without generalised increased sensitivity over the flexor tendons. Distension of the metacarpophalangeal and/ or metatarsophalangeal joint capsules is also commonly seen, but is usually symmetrical unless it is associated with damage to the internal structures.

Undoubtedly, there have been, and will be, times, even if veterinary assistance is sought promptly, when the degree of lameness is not sufficient for a lameness investigation and the localising signs (if there were any) have resolved by the time the investigation is performed.

On the other hand, we keep seeing even high-level endurance horses being eliminated on several occasions for lameness on the same limb. In most of these horses no lameness investigation has been carried out, because the lameness resolved within a few days after the ride. If a chance is given for a prompt diagnosis, then appropriate treatment and management can be applied, minimising the risk of time and costs being wasted on training and entering a competition, potentially resulting in elimination due to the same undiagnosed lameness.
Common causes of lameness in endurance horses

A book chapter provides an overview on orthopaedic injuries (Misheff, 2010) and a paper describes fractures in endurance horses (Misheff et al, 2010). If endurance veterinarians were asked to list the most common causes of lameness in endurance horses, the top 10 list would possibly have the same lesions worldwide, but the ranking would vary among countries and trainers.

To date, no evidence-based data exists on orthopaedic injuries. It is hypothesised that different types of injuries are related to terrain and going – among many other factors. It has been proposed that a worldwide increase in racing speed has led to an increasing number of stressrelated injuries and catastrophic fractures – however, to date, no data supports this hypothesis. There is an ongoing prospective study investigating risk factors for lameness in endurance horses (Nagy et al, unpublished data), which will provide evidencebased data in a few years. This paper is based on personal experience and information collected from endurance veterinarians worldwide.

• Foot pain

Over the long distances on sometimes hard and stony terrain, endurance horses can develop a number of acute foot injuries (such as stone bruises or overreach injuries), which usually are not challenging to diagnose, but are still one of the most common causes of lameness. Concussion may also result in trauma to the distal phalanx, the diagnosis of which may require scintigraphy (Figure 1) and/or magnetic resonance imaging (MRI), especially in early stages when radiological signs are absent.

Foot pain associated with pathology in the navicular bone and related structures is commonly seen. In general terms, some of these horses can be managed successfully with appropriate farriery, and careful selection of training surface and competition, and may be able to perform for many years at a high level.

Laminitis in endurance horses can occur due to concussion, and also as a consequence of metabolic compromise. Cryotherapy has been shown to reduce the severity of acute laminitis (van Eps and Pollitt, 2004) and some trainers and riders routinely ice the horses’ feet between loops to try to prevent laminitis.

• Proximal metacarpal pain

Proximal suspensory desmitis in the forelimb has been long recognised in endurance horses. With the advent of MRI, we have learned that in many horses there are associated lesions in the palmar aspect of the third metacarpal bone and/or small metacarpal bones and the interosseous ligaments. These lesions can also be seen as primary abnormalities without concurrent proximal suspensory desmitis.
Bone trauma (Figure 2) and palmar cortical stress fractures of the third metacarpal bone are diagnosed with increasing frequency, especially in countries where horses compete at high speed.

Subcarpal diagnostic analgesic techniques have the potential to desensitise the distal aspect of the carpus. We have seen horses with abnormal mineralisation in the third carpal bone, in which lameness was abolished by perineural analgesia of the palmar metacarpal nerves. Therefore, the complex anatomy and the close association between the carpus and proximal metacarpal region must be considered. If there is a positive response following subcarpal nerve blocks, the possibility of carpal injury should be borne in mind.

**• Hock pain**

Osteoarthritis of the distal tarsal joints is certainly the most common cause of pain arising from the tarsal region. However, there are other lesions that should be considered when lameness is localised to the hock by diagnostic analgesia. Bone trauma and incomplete fractures of the central and third tarsal bones have been identified in endurance horses. Lameness can be significantly improved by intra-articular analgesia of the tarsometatarsal joint.

Scintigraphy and/or MRI may be essential for accurate diagnosis if there are no radiological abnormalities in order to differentiate from synovitis and early osteoarthritis. Incomplete sagittal fracture of the talus has also been seen in endurance horses. It may not always be identified radiologically initially and scintigraphy can be helpful.

**• Fetlock region pain**

Primary synovitis and osteoarthritis of the fetlock joint is frequently seen in endurance horses, more commonly in forelimbs than in hindlimbs.

Advanced pathologies may be identified radiologically, but in the early stages advanced diagnostic imaging techniques may be needed. Similarly to other sports horses, stress-related injuries in the fetlock region are recognised with increasing frequency and should be considered, especially when dealing with high-level endurance horses.

Bone trauma and short incomplete fractures in the sagittal groove of the proximal phalanx have been diagnosed in endurance horses with variable histories (Figures 3 and 4). Bone trauma can also involve the condyles of the third metacarpal or metatarsal bone and may propagate into an incomplete fracture or, in extreme cases, into a complete fracture. It is important to recognise these lesions in the fetlock region are often desensitised by palmar nerve blocks performed at the base of the proximal sesamoid bones.

**• Muscle pain**
Muscle pain is certainly the most popularly claimed reason for lameness by endurance riders.

Primary muscle damage is occasionally seen, but is rare. Exertional rhabdomyolysis can be seen localised to one hindquarter or both, and in endurance horses it is usually associated with some degree of metabolic compromise.

Often, reduced water intake precedes the development of symptoms. It is therefore crucial that endurance horses are rehydrated (at least 10L to 15L intravenous fluids) before any NSAID is administered.

Focal muscle pain can sometimes be detected and may cause lameness. It is important that other problems are ruled out. Diagnosis is based on a repeatable strong response to palpation of the affected muscle. These muscle strains may be caused by deep going or change in terrain, especially if the horse is normally trained on different surfaces.

We often see riders leaning to one side and their horses developing sore back and hindquarter muscles on the same side.

Asymmetrical weight distribution or the lack of changing diagonal at the trot and/or lead at the canter can result in overloading a diagonal and subsequent injuries. Riders not riding in balance with their horses can also cause muscle pain or exacerbate underlying injuries.

**Back pain**

The author believes back pain is often not thoroughly investigated in endurance horses.

Pain and tension in the caudal thoracic and lumbar region is commonly observed in endurance horses, but in most cases it is considered to be primary muscle pain and is not investigated further. There is no doubt that muscle pain can develop when carrying the rider between six to 12 hours, but, especially if pain persists in training, a thorough investigation should be carried out.

Back pain can develop secondarily to hindlimb lameness, which, especially if subtle and symmetrical, may be unnoticed by the rider. Impinging spinous processes and osteoarthritis of the thoracic articular facet joints is commonly seen in other sports horses and there is no reason why endurance horses couldn’t develop the same problems. If an underlying cause of back pain is identified, specific treatment can be applied.

**Summary**

When investigating lameness in endurance horses, the level at which the horse competes, the terrain and the speed of training and competing have to be considered when formulating a list of differential diagnoses. Stressrelated injuries appear more common in horses that compete at high
speeds, but have to be borne in mind for endurance horses at all levels.

References