Managing pain

Marieke de Vries of the Animal Health Trust raises some fundamental questions on our ability to identify and effectively control pain in horses

A Shetland pony with a dislocated hock. The combination of analgesic agents and immobilisation by means of a strong (Robert Jones) bandage resulted in good pain relief.

Pain assessment in animals is challenging, and requires careful evaluation of behavioural and physiological changes. Unfortunately, the assessment and treatment of pain in horses has not always received as much attention as perhaps dogs, cats and humans. Like all mammals, horses possess the sensory mechanisms to detect and process painful stimuli, and it is, therefore, reasonable to assume that something that causes pain in people would evoke a similar experience in the horse.

Pain

Acute, sudden-onset pain serves a biological function to protect the horse against further injury by enabling it to move away from the potentially harmful stimulus. However, pain may persist or return long after the initial painful stimulus has gone, resulting in persistent (chronic) pain, which can be regarded as a disease, leading to suffering and distress with a negative impact on well-being.

Damaged tissues can release inflammatory substances, which can activate peripheral pain receptors, resulting in an exaggerated and prolonged response to a painful stimulus (hyperalgesia), and in the sensation of pain caused by stimuli, which are normally not painful (alldynia). Both hyperalgesia and alldynia are examples of peripheral sensitisation. Severe or prolonged pain can result in central sensitisation, which, besides alldynia and hyperalgesia, may consist of secondary hypersensitivity: pain sensitisation originating from outside the traumatised area. Chronic pain and central sensitisation can be very difficult to treat and are often unresponsive to conventional analgesic agents (painkillers).

Detection of pain

The ability to detect pain in animals is crucial; if we are not able to identify and treat a horse in pain properly, we simply cannot manage it effectively. Recognition of pain may be difficult because horses are typical prey animals; they try to hide their vulnerability to predators. Horses are known for their individual variation in displaying signs of pain; highly anxious or temperamental horses, such as thoroughbreds, may be more likely to demonstrate intense pain than calm, ‘relaxed’ horses. Abnormal, pain-related behaviour may be masked in unfamiliar surroundings, or in the presence of strangers. Pain recognition can therefore be challenging and relies on a thorough understanding of normal equine behaviour.

The degree of pain perceived by the horse not only depends on the intensity of the painful stimulus itself, but also on the psychological state of the horse at the time of injury, which may complicate pain assessment. Recent studies have shown that fear may decrease pain perception, sometimes even enabling the patient to ignore the injury for a while. This type of stress-induced analgesia may be the reason that a racehorse suffering from severe leg injury during a race, continues to gallop until the finishing line. Anxiety, however, defined as the anticipation of some future, indefinite, potential threat, may result in increased sensitivity to a painful stimulus; horses undergoing castration in unfamiliar conditions may need more anaesthetic drugs compared with horses undergoing castration at their own yard.

Signs of pain in horses are numerous and variable, and may include apprehension, anxiety, restlessness, reluctance to ‘work’, lameness, teeth grinding, flehmen, sweating, kicking at abdomen, rolling and aggression. Horses with front limb lameness, and also sometimes with hind limb ligament injuries, may be found ‘sitting’ on feed or water mangers, a typical example of abnormal, pain related behaviour. Often, however, far more subtle signs are present, which may go unnoticed to the inexperienced or inattentive person. Examples are changes in facial expression (the eyes may seem to be less focused, the ears may be pulled backwards and show
less movement), a lower head position and an unwillingness to interact.

Ideally, assessment of pain should start with observing the horse from a distance, without disturbing it. Look for abnormal postures, abnormal head movements, decreased locomotion, more time spent at the back of the stable, signs of restlessness or depression. Follow this with verbal interaction to assess responsiveness and alertness to voice, and approach the horse, again observing his interaction and response. The final step is a physical approach, by assessing response to touch, first of non-painful areas, followed by gentle palpation of the painful area.

**Examples of common painful conditions in horses**

**Orthopaedic pain**

Limb and foot pain is an often encountered problem in this species. Typical behavioural indicators of orthopaedic pain are well known and recognisable: weight-shifting between limbs, limb guarding, abnormal weight distribution, pointing, hanguing and rotating of the limbs, abnormal movement, and reluctance to move or work. A clear example of pain, resulting in general reduced performance or unwillingness to work without clear signs of pain, is sacroiliac joint (lower back) pain. Often, this condition has an insidious onset and progression, frequently resulting in riders being unaware of the current impairment in gait; horses may appear to be clinically normal, without overt lameness. The condition is often characterised by reluctance to stand on one hindlimb for prolonged periods, a restricted flexibility of the mid spine region, general stiffness and an exaggerated response to pressure applied over the painful area. Although previously both mis- and under-diagnosed, it can now be more readily identified by the injection of local anaesthetic drugs and the use of special imaging techniques such scintigraphy.²

**Laminitis**

The typical stance of a horse with laminitis, one of the most painful conditions possible in horses, is leaning backwards. The extent of this typical abnormal posture depends on pain severity, stage of the disease (acute or chronic), the number of feet involved and the affected region in the foot.

**Colic**

Abdominal pain is often characterised by overt signs, such as groaning, rolling, kicking at the abdomen, flank watching and stretching. Foals may show signs of colic by rolling onto their back. Horses may repeatedly seem to be drinking water, taking a few mouthfuls or standing over the bucket and splashing water around. Recently, a study demonstrated that, after colic surgery, equine patients may not clearly demonstrate the typical ‘colic signs’, but may show more subtle signs of pain, like changes in head and ear position, location in the stable (decreased locomotion and activity), reduced lifting of their feet and decreased responses to food.³ This again emphasises the importance of careful assessment of the patient in order to avoid missing pain.

**Dental pain**

Signs of head and dental pain are often vague, such as head tilting and nodding or a lower head carriage. Changes in attitude to work, problems with acceptance of the bit, sometimes with aggressive behaviour, and reluctance to eat may be observed, and head shyness may develop. Horses with dental pain may have altered eating patterns: slow chewing, dropping of food, pocketing or pouching of food in the cheeks and weight loss. Sometimes a painful swelling may be noticed in cases of tooth abscesses.

**Castration pain**

Unfortunately, pain caused by castration in horses is still subject to debate and limited information on post-castration pain behaviour is available. However, studies have demonstrated that castration, especially clamping of the spermatic cord, elicits a pain response. In farm animals, the provision of analgesia for castration has been well described and public pressure has resulted in strict guidelines to minimise stress and pain associated with the procedure. Therefore, it is disappointing that the effect of various castration protocols on equine welfare have hardly been evaluated. Although horses may not show overt signs of pain, depression, stiffness and stretching may still be noticed. The absence of clear painful signs does not imply that castration is a pain-free procedure, and the administration of an analgesic agent is, therefore, strongly advocated and likely to be of considerable benefit to the horse’s well-being.

**Pain assessment**

The use of pain scales to record pain intensity is well established in human medicine, and is becoming more common in veterinary medicine.

The visual analogue scale (VAS) is a scoring system in which a mark is placed on a 10cm line, the extreme left representing no pain, the extreme right the worst pain imaginable.

Another system is the numerical rating scale (NRS), with behavioral descriptors attached to each number. This can also be used to grade lameness, according to a 0–5 or 0–10-point scale.

Such simple scales can be effective, but are highly dependent on observer training for their consistent application, and often underestimate severe pain.

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² Laminitis in veterinary March/April 2012

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The American Association of Equine Practitioners (AAEP) uses the following:

0 No lameness perceptible under any circumstances

1 Lameness is difficult to observe and is not consistently apparent, regardless of circumstances (e.g., under saddle, circling, inclines, hard surface)

2 Lameness is difficult to observe when walking or when trotting in a straight line, but consistently apparent under certain circumstances (e.g., weight carrying, circling, inclines, hard surface)

3 Lameness is consistently observable at a trot, under all circumstances.

4 Lameness is obvious at a walk

5 Lameness produces minimal weight bearing in motion or at rest, or a complete inability to move

Advanced pain assessment

**Force plate analysis**

This sophisticated technique records the distribution of body weight and changes in forces applied to the ground by each limb. In this way, changes in stride length and contact time with the ground can be analysed. Computer-aided video recording allows the detection of abnormal head, hip and even segmental spine movement. Not only lameness itself but also the effect of analgesic drugs can be studied with these techniques.

**Kinetic analysis**

This is a very novel technique, in which changes in facial expression during a brief painful stimulus were successfully detected in horses. For this technique, reflective markers are placed on various parts of the horse’s face; small movements of facial muscles can be detected by means of an infrared motion-capture device. Although this is a very new technique, and more work is required in, for instance, differentiating between changes in facial expression due to anxiety and pain, the results may be promising.

Time budgets

Real-time videos are recorded from horses for a certain period of time, several times a day. In this way, behaviour can be observed without interruption and disturbance, and also for a longer period of time, making detection of pain-related behaviour more likely. Individual behaviours that can be observed in this way are related to activity (eating, drinking, defaecating, urinating, tail flicking, licking, pawing, rolling, scratching, shaking), locomotion (grazing, walking), pain (flank gestures, flehmen, kicking, stretching, rolling); and resting (standing, lying down). Examples of abnormal behaviour that can be detected are withdrawal, depression, altered sleep patterns, loss of appetite, increased irritability, decreased mobility and pain. Time budgets are calculated by dividing the total duration of each behaviour by the total time recorded, and are expressed as a percentage.

The way forwards

Fortunately, the technique of multimodal analgesia, in which various analgesic drugs with multiple mechanisms and sites of action and various analgesic techniques are combined to ensure optimal pain relief in equine patients, is more frequently applied in routine veterinary practice. Another example of good pain management is the use of pre-emptive analgesia; analgesic agents are administered before a painful stimulus (i.e., surgery) occurs. Studies have demonstrated that the application of pre-emptive analgesia results in less postoperative pain and that it reduces the likelihood of the development of chronic pain postoperatively.

Horses may not show signs of pain as clearly as other species; careful and good interpretation of abnormal, pain related behavioural signs is essential. Hopefully, the development in pain assessment and the improvement in pain therapy techniques in horses, as seen in the last decade, will continue to progress; there is still much room for improvement.

References


