

Equine Pain Management: Acupuncture and Alternative Methods of Pain Management
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Pain

Acute pain is a protective mechanism to prevent or minimize injury. There are varying opinions regarding the duration of acute pain but it is typically the immediate pain associated with traumatic or induced (surgical incision) injury. Prolonged painful stimulus results in chronic or neuropathic pain because the hyperexcitable nerve becomes the source of the pain. Chronic or neuropathic pain is often misdiagnosed or inappropriately treated in veterinary patients. The flight response in equids or the stoic nature of cattle results in fewer easily recognizable physical manifestations of pain than that of small animal patients. Small animal patients will manifest acute pain by vocalization, inappetence or lethargy. Recumbency or vocalizations are often late responses to pain in large animal patients allowing acute pain to go undetected, developing into chronic neuropathic pain. The development of several pain scales have helped clinicians evaluate and treat pain once it has been detected but often, due to the difficulty in recognizing pain, treatment begins late in the course of disease. There are several common chronic/neuropathic pain syndromes in horses but it is also worth discussing some of the uncommon pain syndromes that are not completely understood but likely associated with a neuropathic component.

Pain Syndromes

The most common neuropathic pain syndromes in horses are laminitis, navicular syndrome or caudal heel pain, osteoarthritis, neuroma from a neurectomy or a site of injury, pelvic fracture and back pain associated with kissing spine lesions. Situations in which neuropathic pain is suspected are head shakers, stringhalt, castration and occasionally enucleation. Any chronic pain that alters the behavior, personality and physical appearance of a patient should be considered neuropathic pain.

Neuropathic pain in people is notoriously difficult to treat due to the emotional aspect of pain. Anxiety and depression amplify the pain response. Tricyclic anti-depressants have been a traditional first-line therapy for neuropathic pain in people. Small animal patients manifest anxiety through separation anxiety, self, shoe and furniture mutilation. Equine head shaking and stall weaving are suspected of having an emotional aspect as a response to pain. Behavior is beyond the scope of this discussion but it is valid to consider anxiety or depression when developing a management protocol. Typically, veterinarians treat visible signs of pain with non-steroidal anti-inflammatory agents as first-line treatment. Behavior modification is only introduced when a patient is at risk of harming itself due to excitement. When initial treatment is ineffective, finances are often the primary factor when determining if another analgesic protocol is applied or the animal is euthanized. Fortunately, many veterinary patients have moved to the realm of family members and owners are willing to invest more time and money to dealing with chronic pain. Unfortunately, horses used solely for economic purposes are rarely allowed second changes.

Recognizing Pain

Recognition of pain begins with an owner or manager observing poor performance, lack of activity or poor appetite. The first steps towards developing a treatment plan are observing behavior, including interaction with people, herd members or companions, review of the history and a lameness or thorough physical exam. Serial photographs of the patient are a useful method for following progress of disease and success of treatment.

Chronic pain typically requires aggressive multi-modal treatment to override or control hyperexcitability of the nervous system. Treatment options for pain include the non-steroidal anti-inflammatory drugs, opioids, dissociative agents, local anesthetics (injectable and in transdermal patch form), gabapentin, anti-anxiety or antidepressant medications (acepromazine, fluphenazine, amitriptyline), and techniques like botox administration, epidural drug administration, perineural catheter placement and regional limb perfusion. Treatment choices should include financial considerations, residue concern in meat and milk of cattle and drug detection in horses used for competition.

Treatment Options

Gabapentin is recommended in the initial treatment of neuropathic conditions. Although the mechanism of action is not completely understood, activity at voltage activated calcium channels appears to result in less hyperexcitable nerves, less burning and shooting pain and less allodynia. From personal experience, inclusion of this drug initially in a treatment protocol for neuropathic or chronic pain allows other drugs to be more effective. In humans, gabapentin is effective as an analgesic in only 30% of the population. The success rate in large animals is unknown; therefore gabapentin should be used as part of a multi-modal analgesic plan.

A non-steroidal anti-inflammatory drug should be included in treatment unless a known sensitivity to this class of drug exists. Phenylbutazone and flunixin meglumine are the most common in practice but meloxicam and firoxocib are gaining popularity. Opioids are an effective part of a multi-modal initial treatment plan. Butorphanol, morphine, fentanyl patches and methadone are relatively economical. Methods of delivery include intravenous constant rate infusion, transdermal, sub-lingual, intramuscular or epidural. Tramadol is an attractive alternative for practitioners with cases that require chronic pain medications. Local anesthetics can be used as intravenous infusions, topically with patch placement, in epidural drug administration or in regional limb perfusion. Ketamine can be used as part of a continuous intravenous infusion, by intramuscular injection or as an intravenous bolus or “stun”. It has also been suggested for topical administration in laminitis cases when a hoof wall resection has occurred. The combination of a ketamine infusion with oral tramadol was found to be effective for improving limb loading in chronic laminitis cases. Anti-anxiety and anti-depressant medications should be included for animals that appear to be nervous, hyper-excitable or depressed. Although members of this group of drugs have been associated with negative potential side effects, the alternative option if anxiety is not dealt with is self-injury or euthanasia.

Procedures like perineural catheter placement are useful for constant rate infusion of local anesthetics, particularly for laminitis cases. Botox injection has been recommended for stringhalt or other site-specific neural pathology. Regional limb perfusion of local anesthetic or lidocaine patch placement over an affected area is useful for laminitis or neuroma associated pain.

Long-term management of chronic or neuropathic pain should be tapered as appropriate to treatment response. A team approach with the veterinarian, the owner or manager and other veterinarians or para-professionals allows the best result for long-term care. The inclusion of a nutritionist, acupuncturist and massage therapist is ideal for a positive outcome. Non-steroidal anti-inflammatory drugs, tramadol, sublingual methadone and gabapentin can be part of a maintenance protocol depending on the situation and patient. Keep in mind that 100% improvement is unusual when dealing with neuropathic pain. Owner communication is essential during treatment to establish goals and limits throughout the process.

Alternative Options

Non-steroidal anti-inflammatory drugs should be considered the gold standard for pain management in horses. Unfortunately, some horses have sensitivities to this class of drug that prevents their use. Opioids are useful for perioperative pain and for some chronic pain conditions although the concern over decreased gastrointestinal motility is warranted with use of some of the more potent formulations. Alternative therapies like acupuncture and chiropractic manipulation are becoming more popular methods of maintenance and treatment of pain in horses. In addition, there are drug alternatives or adjuncts like gabapentin, alpha-2 adrenergic agonists, steroids, oral or transcutaneous opioids and herbal formulations. Massage, physiotherapy, magnet therapy, laser therapy, electrical stimulation, ultrasound and other manipulative modalities are gaining popularity. Unfortunately, there is a deficiency in research to back many of these modalities. What does exist for research often only uses or evaluates one aspect of each modality and therefore negative results or positive results are difficult to interpret. Sometimes, just doing something for the horse is beneficial for the sake of the owner or rider.

Acupuncture

Acupuncture originated in China about 5,000 years ago with the fundamental principles dating 3,000 years before that. Needles were originally made of stone and eventually replaced with metal around 110 B.C. The theory involved in acupuncture is that we have meridians or lines of qi (pronounced "chee") or energy flowing through these meridians. Disease processes or inflammation alter or stop the flow of qi. Therefore, introduction of a needle in points along these meridians opens the energy flow as well as the release of endorphins, serotonin, norepinephrine or gamma-aminobutyric acid. Acupuncture is not limited to needle placement. There are many techniques used to stimulate points and meridians: massage or acupressure along the meridians, the burning of moxa (an herb that burns very warm) over points or the application of the burning herb on the ends of needles to warm the needles, hemoacupuncture or simply pricking acupuncture points and allowing bleeding, the injection of blood, saline or B-12 at acupuncture points for

longer stimulation and the placement of implants at points (gold beads or surgical staples). There are multiple peer-reviewed studies published describing the use of acupuncture for equine care. A study in 2005 describes the successful use of electroacupuncture for chronic thoracolumbar pain (Xie H, Colahan P and Ott EA 2005). The usefulness of acupuncture for reproductive problems has been credited to hormonal regulation, an alteration in smooth muscle motility and the relief of stress or pain due to musculoskeletal or environmental conditions (Schofield WA 2008). There are many uses for acupuncture but, like any treatment modality, it does not work for every patient.

Chiropractic

Veterinary chiropractic manipulation started in the early 1900's and was semi-formalized in the late 1980's through accepted training programs. The American Veterinary Chiropractic Association is the primary organization in the United States that oversees training in veterinary chiropractic principles and techniques. This treatment modality must be performed by a licensed veterinarian or by a licensed human chiropractor under the supervision of a licensed veterinarian (regulations vary in every state). The concept behind chiropractic is the manipulation of joints and soft tissues through mobilization, manipulation and adjustment.

Massage and Physiotherapy

Massage is the rubbing or kneading of muscles and soft tissues to aid in circulation and relaxation. There are several veterinary massage courses including the Chinese version called Tui-na. Massage and physiotherapy are modalities that can be performed by veterinarians and paraprofessionals (technicians, assistants and therapists) and are not limited to licensed veterinarians (although again, in some states this modality can only be performed under the supervision of a licensed veterinarian). Physiotherapy is performed in collaboration with veterinarians to treat injuries or movement dysfunction and combines techniques like mobilization, stretching, massage and electrotherapy. Often, a treatment plan is developed specific to each patient that will include exercises to be performed at the farm between treatments.

Laser Therapy and Electrical Stimulation

Low Energy Photon Therapy, Cold Laser, Low Level Laser Therapy and Soft Laser are all names used to describe a therapeutic method that utilizes red or infrared light to increase healing. The method was initially developed in 1960 for superficial wounds and is believed to promote cellular regeneration, production of collagen for tissue repair, vascular dilation and production of endorphins. Red light is used for superficial wounds or injuries and infrared light is used for deeper treatments. This therapy is not limited to veterinary professionals and can be utilized by owners at home. Electrical stimulation involves the application of electrodes to the skin to provide electrical pulsed stimulation to muscle fibers. This modality is believed to promote muscle strength and reduce pain but has little research to back these findings.

Ultrasound Therapy

Cornell University developed a compact ultrasound unit called the UltrOz Therapy System that is available for the veterinary community, animal owners and caretakers.

The unit can be attached to the leg (or other locations on the body) for 2-4 hours of treatment. The treatment method is believed to accelerate and shorten the inflammatory phase of healing, increase local circulation, boost cellular permeability, improve collagen synthesis, decrease edema and increase the release of natural analgesics. A study published in 2006 involved cutting and repairing the superficial digital flexor tendon in goats and then using ultrasound therapy for half of the patients to assess healing. The sonication was performed at 1 MHz with an intensity of 1 W/cm² for 10 minutes per day for 10 days. After 30 days, treated tendons had a regression of adhesions between the skin and tendons, the tendons were more normal in thickness and density and had better organized granulation tissue than the non-treated group (Maiti et al. 2006).

Magnetic Blankets

Magnet therapy has been recommended for accelerating healing by increasing blood flow in areas in which magnets are placed, reducing inflammation and easing soreness. The benefit of this method of therapy is the simplicity of use. There has been limited research in this field but a recent study found that magnetic blankets, compared to a placebo blanket did not find any difference in blood flow, surface temperature or muscle tension between the blankets on horses (Edner, et al. 2014).

Summary

Opioids, alpha-2 adrenergic agonists, gabapentin, steroids (intra-articular, epidural, intrathecal or systemic), herbal, homeopathic and food therapies are additional alternative options available for treating pain. Often, competition schedules or owner preference will direct the veterinarian when creating a treatment plan for each patient. For the performance horse, alternative physical therapies avoid the complications associated with drug testing. Caution should be used with herbal formulations and homeopathic medications that are not under the jurisdiction of the Food and Drug Administration as ingredients are not always listed on packaging. Aspirin or other drugs might be combined in “herbal” formulations without appropriate labeling. There is not one single treatment modality that is perfect and that will work for every patient. Therefore, combining physical therapies with appropriately dosed medications, supplements or diet change produces the best outcome.

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