

Triaging Acute Equine Neurologic Emergencies

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A horse owner's day can go from great to horrific in a matter of seconds if he or she arrives at the barn to find their charge either staggering around the field or completely unable to rise. A prompt call to the veterinarian is warranted in these scenarios, but what should an owner expect when the veterinarian arrives?

Amelia S. Munsterman, DVM, MS, Dipl. ACVS, ACVECC, a clinical lecturer in equine emergency and critical care at the Auburn University College of Veterinary Medicine, reviewed the steps in triaging acute neurologic emergencies at the 2013 Western Veterinary Conference, held Feb. 17-21 in Las Vegas, Nev.

"Neurologic emergencies are a challenge for the veterinarian as well as the horse owner," Munsterman said. She noted several diagnostic hurdles veterinarians typically encounter when dealing with an acutely neurologic horse:

- **The fight or flight temperament:** The horse's fight or flight temperament can make them somewhat unpredictable when they're sick or injured, which can increase the risk of injury to themselves and to the people trying to help them.
- **Imaging limitations:** A veterinarian's ability to identifying internal abnormalities via imaging modalities such as MRI or CT scan is limited in large patients like horses. Therefore, they must apply other diagnostic modalities.
- **Specialized testing:** Tests for infectious diseases must be submitted to an outside laboratory and the results might not be available for days.
- **Risk of infection:** Munsterman stressed that veterinarians should consider rabies as a differential diagnosis for any horse presenting with neurologic signs. This means all people in contact with the horse should wear gloves and the number of people working with the animal should be limited to reduce the risk of human infection with this zoonotic disease.

A veterinarian should have several goals when triaging a neurologic horse, Munsterman said:

- Identify if the nervous system is involved;
- Rule out or identify problems involving other body systems;
- Provide a list of differential diagnoses and discuss any risks and potential expenses with the owner early;
- Initiate supportive care and treatment; and
- Facilitate referral to a clinic or hospital, if needed.

Step one to achieving these goals is to examine the horse.

Examining the Acutely Neurologic Horse

Munsterman explained that the initial examination of a neurologic horse generally isn't easy; these horses are often severely ataxic (incoordinated) or recumbent (unable to rise), or they could be hyperexcitable (excessively reactive to stimuli), all of which complicate physical examinations.

Nonetheless, she said, it's crucial to be "as thorough as possible, considering the situation." She noted that findings during the physical examination can help veterinarians narrow the long list of differential diagnoses.

She first said veterinarians should evaluate the horse's overall mentation, making note of whether the animal seems confused, hyperexcitable, or dull. He or she should also identify stupor (meaning the horse only responds to intense stimuli) and any coma or seizure activity, Munsterman said. She noted that seizure activity could be as subtle as focal muscle twitching or as major as a "grand mal" event.

Next, she said the veterinarian should examine the cranial nerves. The cranial nerves control the facial muscles and certain specialized activities of the head (such as sight, smell, and hearing), and veterinarians test these nerves' function by evaluating the horse's response to a quick hand movement toward the eye (i.e., whether he flinches).

If the horse is standing, Munsterman said veterinarians should evaluate his posture at rest, looking at the horse's head and neck position and noting any head tilts or fasciculations (twitches). Munsterman said the practitioner should also evaluate head and neck movement (for instance, does moving the head and neck cause increased muscle tremors?) and note any abnormalities. Also, he or she should check for nystagmus (rapid, involuntary, rhythmic eye movements that are often indicative of central nervous system dysfunction).

After the head and neck, Munsterman said veterinarians should evaluate the rest of the horse's body position. He or she should assess the horse's stance and trunk position, noting abnormal stances and any muscle atrophy. It's also important to determine whether the horse can feel sensations along his neck and body; if they can, it indicates that nerves from their spinal column are still functioning, Munsterman said.

Additionally, she stressed the importance of evaluating the horse's tail and anus. She cautioned that if there's little tail tone and the horse cannot feel sensations on his tail or anus, he likely won't be able to defecate normally and will need additional supportive care.

It can be challenging or even impossible to evaluate a severely ataxic or recumbent horse's gait, Munsterman said, but there are evaluation options even for these patients. For recumbent horses, she said, the veterinarian can assess limb strength and sensitivity, reflexes, and whether the horse can retract or extend his limbs. He or she should flip the recumbent horse over to examine both sides, she said.

If a gait evaluation can be carried out, Munsterman said the veterinarian should assess the horse at a walk and a trot (if possible), watching for abnormalities including a swaying trunk, increased pelvic limb strides, "waving" limbs before placement, crossing limbs, and stepping on feet. Next, the veterinarian should observe the horse circling, backing, and going up and down hills or curbs; any deviations from normal should be noted here, as well. The veterinarian should also perform a tail pull to determine how weak a horse is in his hind end, she said.

After a thorough examination, Munsterman said veterinarians should be able to start localizing lesions based on clinical signs. For example, brain stem lesions can present with weakness, ataxia, cranial nerve deficits, and altered mentation. Cervical spine deficits, on the other hand, cause neurologic deficits in all four limbs. Munsterman reviewed some different localizations and related clinical signs with veterinary attendees.

Narrowing Down a Diagnosis

After the physical examination it's time for veterinarians to narrow down the list of differential diagnoses, Munsterman said. The list of differentials for acute onset neurologic deficits is long and includes the following disorders:

- Trauma or injury (the No. 1 cause, Munsterman said);
- Infectious disease (including Eastern, Western, and Venezuelan equine encephalitis; West Nile virus; equine herpesvirus; rabies; and equine protozoal myeloencephalitis [EPM], among others);
- Bacterial meningitis (which Munsterman said is quite rare);
- Polyneuritis equi (or cauda equine syndrome; this progressive disorder involves a loss of function of the nerves of the tail and, most commonly, the anus and is not treatable);
- Equine degenerative myelopathy;
- Cervical vertebral stenotic myelopathy, or wobblers syndrome;
- Electrolyte disorders;
- Toxin ingestion; and
- Hepatic encephalopathy.

Based on physical examination findings and an understanding of the disorder, the veterinarian can piece the puzzle together to formulate a short list of possible diagnoses. Based on that list, the veterinarian can select diagnostic testing options and move forward with treatment.

Early Treatment

Because diagnostic test results can take days to come in, Munsterman said it's important to start treating the patient as soon as possible. This largely surrounds providing the horse with any supportive care he needs to counteract physiologic and/or metabolic disorders.

While some less severely affected horses can be treated in the field, veterinarians often refer severely affected horses to a clinic. "The daily care and physical needs of the equine neurologic patient are the primary reason many horses are referred," Munsterman said. "It is difficult for owners, especially on a farm, to logistically provide for an animal that weighs over 1,000 pounds."

Regardless of where the horse is treated, she recommended starting the patient on an EPM treatment if that is even remotely suspected, along with non-steroidal anti-inflammatory drugs (NSAIDs) to help manage any pain and inflammation. She also noted that adjunct therapies such as intravenous dimethylsulfoxide (DMSO) administration and natural vitamin E supplementation might help some horses afflicted with neurologic disease.

Supportive care includes ensuring the horse's nutritional needs are satisfied and that they can urinate and defecate or regularly empty their bladder and rectum. Recumbent horses develop pressure sores over time and should be flipped every three to four hours, Munsterman said. If horses will tolerate it, use a sling can to help them remain upright, reducing the risk of pneumonia and pressure sores, she added.

Munsterman reminded, "Horses with acute neurologic signs should be considered biohazards until test results return, both to humans (i.e., rabies) as well as other horses (i.e., neurologic equine herpesvirus)."

Once test results arrive, the veterinarian should discuss the best steps to take moving forward.

Take-Home Message

"The overall outcome for acute neurologic injuries can be improved by prompt and aggressive care," Munsterman concluded. She stressed that veterinarians should never withhold or delay treatment due to the lack of a specific diagnosis.

Disclaimer: Seek the advice of a qualified veterinarian before proceeding with any diagnosis, treatment, or therapy.