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David Marshall, VMD
Delaware Equine Extension Veterinarian

Tying Up

Summer and a leg up in the sun coincide with a leg up in the pleasure we derive from our horses. This heightened horse and rider interaction directly implies increases in training periods, greater exercise demands, and often altered management for our horses. To our horse's muscles, these increased demands frequently result in stiffness and painful cramping. Left unchecked, this can further lead to partial or the complete inability to move. On the rare occasion, these muscle signs can progress to complete muscle shutdown, collapse, and even death.

Muscle tissue has a limited response to differing insults whether traumatic, exercise induced, or due to underlying muscle disease. This limited response just means that for the muscles that are not working properly, they will be simply stiff or sore or a combination of stiff and sore. Unfortunately stiff and sore muscles tell us little about the cause of the muscle stiffness and soreness. Therefore, let me try to bring some clarity to this "muscle" double-talk.

A common complaint of a horse owner, trainer, or enthusiast is that of their horse suffering from muscle soreness, stiffness, or bouts of muscle stiffness and soreness. The horse person may say something like this to their veterinarian: "Doc, my horse is tying up, what should I do?" Just how frequently is this stiff-horse, muscle-sore, tying up observation made by the horse enjoying public? A 2005 study in Great Britain was obtained through the interviews of more than 200 people with equestrian connections. Greater than one forth of the respondents reported having horses within a one year period of time suffering from some level of muscle soreness requiring veterinary attention. The complaint may vary from a horse demonstrating a mild stilted gait, to severe stiffness, sweating, or recumbency. However, most horses are mildly to moderately affected.

There are two very broad arrangement groupings or categories for muscle diseases. The first group being that of the muscle damage group caused primarily by strains, tears, or from direct trauma. Direct trauma can result from a direct hit or trauma in the order of a poorly fitted saddle; or may be a rider bouncing up and down all day long. The second group I'll address is the so called exertional rhabdomyolysis [ER] group. This second group, the ER group, has a cellular, microscopic metabolic cause; where as the first group muscle strain, tear, or trauma group almost always results from overworking in some form or other. If classifications were only that "two-fold" simple! What complicates the issue is

that some ER's result from periods of overworking your horse; and in most all cases of both type-one [strains and tears] and type-two [ER], muscle stiffness in one form or another is the owner complaint and horse presenting sign. It therefore follows, in some cases establishing a definitive diagnosis may be difficult. Please do not allow discouragement to rule; arriving at a specific diagnosis may be challenging, but none the less important to the future well being of your horse. In working towards a classification diagnosis, you veterinarian will broadly ask themselves the diagnostically significant question: Is this horses muscle stiffness and soreness a result of damage from a strain or tear? Or, is this stiffness and soreness better explainable due to defective muscle function expressing the defect during periods of exercise?

Muscle damage secondary to, or caused by trauma, strains, and tears is the most straight-forward to explain and understand, so let me start with the muscle strain explanation. In this case, the site of damage dictates the signs. These signs may include leg stiffness, identified as lameness, or may be something described as back stiffness. In the acute stages, palpation may reveal painful muscles with localized heat and swelling. Delay in the onset of painful inflammation after trauma may complicate the history. For example, pain may be evident in show jumpers and eventers [both prone to back and hip muscle strains], as an unwillingness to jump or turn. Cattle cutting horses and time-trial cutting horses, especially if of the under conditioned, weekend warrior variety, are especially prone to tearing the heavy muscles of the legs and hips [gluts']. Other horses may merely demonstrate mild to moderate lameness or stiffness.

Management and therapeutic aims for the muscle strains include ice or cold water therapy during the acute stage to stop the damaging properties of the inflammatory process. This will be followed by adequate rest [sometimes reducing level of work is adequate rest] to minimize further damage. This allows for repair and regeneration of the damaged muscle. Muscle has a remarkable capacity to repair itself and even regenerate the damaged muscle fibers if given appropriate healing time. Anti-inflammatory anti-pain drugs, muscle rehabilitation programs, and heat and massage therapy may be prescribed by your veterinarian to augment healing. Although traumatic injuries may be difficult to prevent, exercise-induced stresses and strain injuries are far less likely to occur when horses are properly conditioned, are size-fitted with appropriate equipment, and are warmed-up and warmed-down before and after exercise.

If the preceding type-one muscle strain/trauma discussion seemed straight forward, hang on; let us now move on to the second major type: exertional rhabdomyolysis syndrome [ER]. ER is the painful cramping of a horse's muscle caused by a multitude of physiological muscle disturbances; disturbances occurring at the microscopic level of the muscle fiber. In the horse world vernacular, ER is referred to as "tying up", "Monday morning disease", "set fast", "kidney shot", and "azoturia". These are all terms associated with the broadly characterized syndrome now preferably referred to as ER. ER is both acquired and inherited. The multiple physiological disturbances include electrolyte regulation disturbances and muscle energy source [polysaccharide] disturbances where the polysaccharide energy source to the muscle fiber is not metabolized properly. Electrolyte regulation malfunction or the polysaccharide utilization malfunction leads to presenting

signs, typically muscle stiffness and muscle pain. Having said what I said let me take this discussion of ER to yet another level of complexity. Just because any given horse may have the genetic weakness or predisposition for ER, this does not mean that this horse will always suffer from ER. Trigger events such as respiratory infections, inadequate levels of certain micronutrients like selenium and vitamin E, hormonal changes in susceptible fillies and mares, electrolyte imbalances, and exhaustion exercise have all been associated with the expression of ER in genetically sensitive horse.

Horses experiencing bouts of ER suffer from stiffness and cramping, especially of the heavy muscles of the back and rear. Signs may include elevated heart rate, excessive and unexpected sweating, stiff gait, difficulty in backing, and a reluctance to work on or even walk. Please note: clinically it is frequently impossible to differentiate signs of muscle ER from signs of muscle strains; the signs are the same or very similar.

Reaching a diagnosis of ER is not usually difficult, but properly and specifically categorizing ER according to the specific muscle microscopic defect or genetic predisposition is much more difficult. Attempting to arrive at a specific form of ER becomes quite necessary however because prevention and control success is directly linked to the identification of the specific cellular defect. This means extensive diagnostic testing by your veterinarian to elucidate the specific cellular defect. Because the root is frequently genetic, breed type and even gender helps direct veterinary diagnosis. For example, recurrent tying up in the quarter Horse, Paints, and their crosses is commonly caused by the heritable glycogen disorder called polysaccharide storage myopathy, or PSSM. PSSM is also more common in over weight, poorly conditioned horses that are pushed beyond their endurance. On the other hand, young, highly nervous thoroughbred fillies are sensitive to another form of ER referred to as recurrent exertional rhabdomyolysis [RER]. RER is a specific type of ER most commonly found in nervous horses within certain families of Thoroughbreds, Arabs, and probably Standardbreds. Factors that appear to trigger the RER form of ER are gender [more common in fillies], temperament [more common in nervous horses], stress-excitement, lameness, high-grain diets, and strenuous exercise [altered duration and/or intensity].

A vast number of anecdotal, home remedy treatments have been attempted through the years, typically when one is unable or unwilling to establish a precise diagnosis. Most of these are of questionable or limited effectiveness. Specific diagnosis is our greatest hope for preventing and controlling cellular malfunction ER. History and presenting signs, physical examination of your horse, exercise testing, blood samples, electrolyte clearance ratios, blood vitamin E and selenium tests, muscle biopsies and more are now standard diagnostic tools your vet may order. With a specific diagnosis of the cellular malfunction ER, prevention and control therapies are reasonably effective in limiting further muscle damage. Management and treatments may include diet changes such as reducing or eliminating grain from the diet and substituting fat as an energy source. Additionally, gradual training programs with plenty of turn out and daily exercise are utilized.

Electrolyte therapy, antioxidant supplementation, and numerous specific drugs may be included in your veterinarian's treatment recommendations.

ER is one of the most common muscle disorders in the horse. It is a complex disorder with many possible causes. Current research suggests that many horses with repeated episodes are susceptible to ER because of an inherited disorder. As with most diseases, prevention, management, and proper treatment of episodes of ER can occur only once the cause has been determined. Last but not least, muscle relies upon conditioning through regular and determined exercise.