Ask the Vet with Dr. Steve Fisch, DVM

Dear "Ask the Vet,"
I heard someone talking about losing a horse to "Monday Morning Sickness." I couldn't find much on-line in laymen's terms and was wondering if you could fill me in on what it is and what causes it?

Thanks,
Ben

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"Monday Morning Sickness" is a broad term that frequently is used to describe a wide variety of muscle disorders that affect the performance horse. Other names given to this syndrome include exertional rhabdomyolysis, tying up, and azoturia. Historically it was thought that all horses showing evidence of muscle cramping and soreness have the same condition. However, research has shown that there are a number of specific disorders that fall under the term tying-up. Research has provided a much better understanding of the causes of tying-up and has led to improved methods for prevention of recurrent episodes.

The clinical signs of tying-up are varied, depending on the severity of the episode. In milder cases, affected horses will be a little stiff after training. At the other end of the spectrum, the intense pain associated with severe and generalized tying-up might have the horse to the point where he is unable to stand and bear weight. During exercise, affected horses develop a short, stiff stride; these signs can worsen if exercise is continued. Upon ceasing exercise, horses often are very reluctant to move and might adopt an unusual stance; The muscles of the hindquarters usually are the most severely affected. This area will be firm and painful, and cramping is evident when these muscles are palpated. Other signs might include profuse sweating and persistently elevated heart and respiratory rates due to pain. The pain persists for several hours after the onset of a tying-up episode.

In severe cases, horses will pass a dark, red-brown colored urine. This discoloration is due to the presence of a muscle protein called myoglobin and is called myoglobinuria. With extensive damage to muscle fibers, a large amount of myoglobin leak into the horse's blood and subsequently are passed out of the body through the kidneys. If horses with myoglobinuria are allowed to become dehydrated, they might develop life threatening kidney damage.

Diagnosis of tying-up is confirmed by detection of elevated serum activities of creatine kinase (CK) and aspartate animotransferase (AST). Like myoglobin, these proteins are contained within muscle cells and are released into circulation when cells are damaged. CK levels, a specific indicator of muscle damage, increase rapidly with peak values occurring four to six hours after an episode of tying-up. Compared to CK, activities of AST increase and decrease more slowly; AST might remain elevated for seven to 10 days after an episode.

There are two broad category of tying up. Sporadic exertional rhabdomyolysis is the classification that applies to horses which, on rare occasion, experience an episode of

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generalized tying-up. The second category is chronic exertional rhabdomyolysis, and this is when a horse experiences repeated episodes of ER, with the first episode usually occurring at a young age.

A common cause of sporadic tying-up is exercise that exceeds the horse's underlying level of training or asking a horse to perform a maximum amount of exercise after a lay-off and with only minimal training before the event. Electrolyte imbalances,particularly low sodium and deficiencies of vitamin E and/or selenium might play a role in some cases..

The most frustrating muscle disorder is chronic exertional rhabdomyolysis. Affected horses are prone to repeated episodes of tying-up. Over the years, many different causes of chronic tying-up have been proposed, but few have been proven. These include hormonal imbalances (particularly low thyroid hormone), electrolyte imbalances, lactic acidosis within muscle, and vitamin E and/or selenium deficiency. Electrolyte imbalances can be an important factor in the development of chronic tying-up. Imbalances of sodium, calcium, and phosphorus cancontribute to tying-up problems. Many affected horses showed marked improvement after addition of sodium or balancing of the calcium:phosphorus ratio in the diet. Electrolytes such as sodium, potassium, and chloride are important for muscle function. Horses lose a large amount of these electrolytes in sweat. Therefore, heavy working horses may require electrolyte supplementation before, during, and after competition. Other types of athletic horses require additional salt in their diet (one to two tablespoons of table salt (NaCl) and lite KCl). However electrolyte imbalances are not the main cause of tying up.

Two major causes of chronic tying-up are recurrent exertional rhabdomyolysis (RER), in which there is a defect in the mechanism of muscle contraction and polysaccharide storage myopathy (PSSM), a disorder that results in storage of excess carbohydrate in muscle. Genetic sutudies suggest that RER is an inherited condition . The underlying problem is a defect in the mechanism for muscle contraction. The muscle has increased sensitivity to contraction when exposed to certain stimuli. It is possible that excitement triggers this abnormal response in the muscle of horses with RER The second common cause of chronic tying-up, polysaccharide storage myopathy, is a condition characterized by accumulation of glycogen ,a form of carbohydrate and an abnormal form of polysaccharide, a complex carbohydrate in muscle. PSSM has been identified in Quarter Horses and related breeds, Appaloosas, Paints, warmbloods, draft horses, and Thoroughbreds..

Clinical signs of PSSM can develop at a young age, often when the horse enters training. Rest for a few days prior to exercise is a common triggering factor, but unlike RER, horses usually have a quiet personality. Some horses can be affected every time they exercise, while others might have only periodic episodes. However, it also is common for affected horses to have ongoing bouts of muscle damage that are not associated with clinical signs of tying-up, but which result in persistent elevations of serum CK.

Acutely tying up horses which are distressed, reluctant to move, or have discolored urine require immediate veterinary assistance. Correction of dehydration by administration intravenous fluids is of critical importance. Myoglobin is toxic to the kidneys, and dehydration along with myoglobinuria can result in development of kidney failure. Physical therapy is also an important part of the treatment plan. Walking as prescribed by an equine veterinarian, massage, warm baths and blankets are all part of the therapy for tying up.

In horses which tie-up two, three, or more times, a detailed diagnostic evaluation to identify an underlying cause of the exertional rhabdomyolysis is warranted. This work-up will include a complete blood count, serum chemistry and collection of a sample of urine to allow assessment of electrolyte balance. Another test is microscopic evaluation of muscle biopsy samples. Storage of abnormal polysaccharide is the main feature of muscle biopsies from horses with PSSM.

~As you can see, tying up is complicated syndrome. We will finish this discussion next month by discussing management of horses with this condition. I hope you had a Merry Christmas and a great 2014!

Ask The Vet

We would like to help you get your horse health questions answered by a knowledgeable equine veterinarian. Submit your questions to us via email, we will present them to a qualified veteranarian that specialize in equine health and then publish the question along with the vet's response in a future issue of The Horse Resource.
Ask away..... Send questions to us at:
thehorseresource@msn.com Subject line: "Ask the Vet"

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