Muscle Conditions Affecting Sport Horses

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KEYWORDS

• Rhabdomyolysis • Tying up • Myopathy • Polysaccharide storage • Atrophy

KEY POINTS

- Minor derangements in locomotor muscle function will impact power output, coordination, stamina, and desire to work during exercise.
- Subtle muscle atrophy reduces power output and impacts gait and athletic performance.
- Muscle strains, tears, and cramps are remarkably painful.
- Exertional myopathies such as type 1 polysaccharide storage myopathy (PSSM1), PSSM2 in Quarter horses, malignant hyperthermia, recurrent exertional rhabdomyolysis, and myofibrillar myopathy (MFM) in Arabians are characterized by rhabdomyolysis and high serum muscle enzymes.
- Other exertional myopathies, such as PSSM2 and MFM in Warmbloods, are characterized by exercise intolerance, reluctance to go forward, collect, and engage the hindquarters, and have normal serum muscle enzymes.

INTRODUCTION

Optimal function of skeletal muscle is essential for successful athletic performance. Even minor derangements in locomotor muscle function will impact power output, coordination, stamina, and desire to work during exercise. Veterinarians readily recognize signs of acute rhabdomyolysis and can confirm a diagnosis of rhabdomyolysis with assessment of serum creatine kinase (CK) and aspartate transaminase (AST) activities. Subtle muscle pain and weakness can also impact performance, but detecting their role in poor performance represents more of a diagnostic challenge because serum muscle enzyme activities are normal. Experience, select diagnostic tools, and horsemanship are often needed to determine the following:

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- The impact of muscle weakness on performance and gait
- The contributions of muscle pain, behavior, rider, or tack on poor performance
- Whether muscle pain is primarily a result of a muscle disorder or arising secondary to an underlying orthopedic disorder

In this review, the presenting clinical signs, differential diagnoses, approach to diagnostic testing, and treatment of muscle atrophy and weakness, focal muscle strain, and exertional myopathies are discussed (Fig. 1).

MUSCLE ATROPHY AND WEAKNESS

A marked reduction in muscle mass is readily recognized by veterinarians; however, gradual subtle changes often go unrecognized by owners and veterinarians. From an athletic perspective, even minor reductions in muscle mass will reduce power output and impact performance. Thus, owners and veterinarians involved in sports medicine are advised to routinely monitor muscle mass in sport horses and investigate causes of muscle loss at an early stage when treatment can be effective.

Loss of muscle mass can be focal or generalized. The inciting cause can be damage to the motor nerve supplying the muscle (neurogenic) or direct damage or atrophy of muscle fibers (myogenic) (see Fig. 1). Focal causes of muscle atrophy and a diagnostic approach are outlined in Fig. 2.

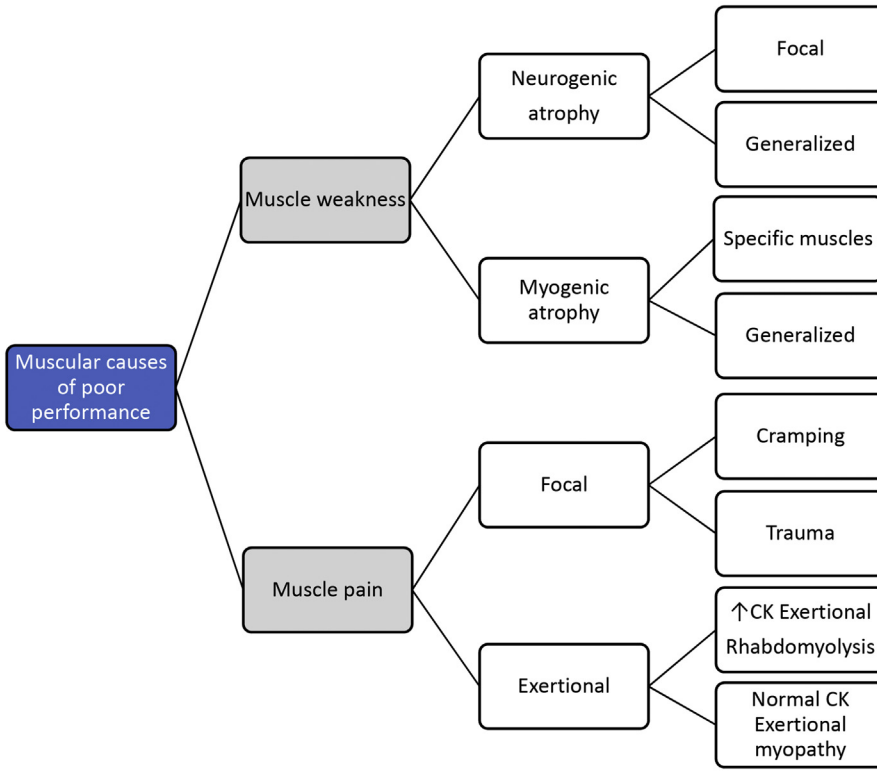

Fig. 1. Muscular causes of poor performance in horses.