

‘Tying-up’ in the thoroughbred



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Thoroughbreds are often affected by exertional rhabdomyolysis – also known as ‘tying-up’ or ‘Monday morning disease’ – after exercise

Exertional rhabdomyolysis, also known as ‘tying-up’, ‘setfast’ and ‘Monday morning disease’ is a condition frequently encountered in the thoroughbred following exercise. Affected individuals can become very uncomfortable, sweat profusely and be reluctant to move as the muscles running over their hindquarters tighten and cramp up.

Two forms of exertional rhabdomyolysis (ER) are recognised in the thoroughbred in training;

- Sporadic exertional rhabdomyolysis (SER)
- Recurrent exertional rhabdomyolysis (RER)

SER is a one-off event, most frequently observed in a horse that has exercised beyond its current level of fitness. This can occur following a period of rest, or in a horse that is stepped up to the next phase of its training programme for which its current level of conditioning does not permit.

RER is observed in approximately 5% of thoroughbreds and is believed to be caused by an inherited condition that affects calcium regulation within muscle cells. This can result in repeat episodes of ER of varying severity. RER tends to be more frequent in fillies, in two-year-olds and in horses with a nervous or excitable disposition. It can be triggered by stimuli such as high dietary levels of carbohydrates and prolonged or intense exercise.

A presumptive diagnosis is often

made following identification of the recognised clinical signs. Some of these are obvious, whilst others require careful examination. An increased heart rate, profuse sweating, muscle tremors and pain and firmness upon palpation of the back and hindquarter musculature combined with a stiff action at the walk are regularly noted.

Rarely, the muscles of the forelimb or flank may be involved. Affected individuals will frequently trot in-hand more comfortably than they walk. In extreme cases, the horse may be reluctant to move and may produce a dark coloured urine due to the release of a protein called myoglobin from the damaged muscle tissue. Mildly affected horses may display only subtle non-specific clinical signs, such as feeling or looking ‘short behind’ on the way back in from exercise. Some can also remain asymptomatic for a period of time.

A definitive diagnosis is obtained by analysing the blood levels of two muscle enzymes; creatinine kinase (CK) and aspartate aminotransferase (AST). Each of these enzymes is released from muscle cells and into the bloodstream at a level

proportional to the amount of muscle breakdown. CK is released quickly with blood levels peaking between four and six hours after the clinical episode. The CK levels will then decrease rapidly and normalise within 24-48 hours.

AST is released more slowly, will peak within approximately 24 hours and then decrease slowly over at least the following week. It is the combined picture of the blood levels of these two muscle enzymes that can help us determine not only the severity of the ER episode, but can also suggest whether we are dealing with an isolated case of ER or if the horse has had previous ER episodes leading up to this identified clinical case. A blood sample is most frequently obtained approximately six hours following exercise.

The initial management of ER is dependent upon the severity of the first identified episode. For mild cases, where blood sampling was required for a definitive diagnosis and in a horse that has displayed no or only subtle clinical signs, continued training with the addition of a pre-exercise orally administered skeletal muscle relaxant is most frequently recommended. In addition, these



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|--------------|------|------|--------------|
| CPK | 9606 | iu/l | (100 -300) |
| AST | 1236 | iu/l | (150 -600) |

Figure 1 Laboratory result following analysis of creatinine kinase (CPK) and aspartate aminotransferase (AST) levels within the blood. This result indicates a marked episode of ER in this animal. Normal reference values are in the brackets on the right

» individuals will normally undergo horse-walker exercise on top of their normal morning ridden exercise. Repeat blood sampling will be performed weekly, both when receiving the skeletal muscle relaxant and also when administration has ceased, in order to ensure that the ER episode has been controlled and no further episodes of ER occur.

For more complex or severe cases, there are multiple other avenues that can be explored to aid muscle function and recovery, and attempt to reduce the chances of subsequent ER episodes. Since there are several causes, some of which appear to be inherited, there is no single cure and some horses may prove almost impossible to train.

Most cases will simply require management of the acute muscle cramping pain, with a single dose of intravenous non-steroidal anti-inflammatory indicated. If the horse is distressed then a single intravenous dose of sedative may also be useful. Thankfully severe episodes are rare, but if they do occur, prompt the use of intravenous fluid therapy to flush out the muscle



Figure 2 Some of the medicines commonly used in cases of ER

breakdown products in order to limit their damaging effect on the kidneys. Complete rest is contraindicated in all but the most severe of cases as this may only add to an increased risk of further ER episodes upon exercise resumption.

A return to training can be aided by the prophylactic use of skeletal muscle relaxants, with or without oral sedation for those excitable or nervous individuals. Rest days should be avoided as these will increase the risk of ER upon a return to exercise, and daily horsewalker exercise with or without turnout are both

considered useful adjuncts.

Most manufacturers now include a 'tying-up' feed in their range with a low carbohydrate content and an increased fat content, providing most of the energy required to train. The mechanism for this dietary alteration is not fully understood and it may be the exclusion of carbohydrates rather than the protective effects of dietary fat that helps.

Given the link between a nervous disposition and RER, increased dietary fat may make these horses calmer prior to exercise.

Whilst there are several premixes available with this increased fat to reduced carbohydrate ratio, it can become a balancing act trying to maintain optimum condition in a horse in full work using these premixes as the sole source of hard feed. Partial inclusion of a normal racing diet may therefore be necessary.

Standardised daily routines and an environment that minimises stress and excitement will contribute to the prevention of further episodes of tying-up in susceptible horses.