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Review of "Evaluation of horses with poor performance"

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Why was this paper written?

The authors state that veterinarians are often called upon to evaluate a horse because its owner feels the horse is not performing to its full potential. It then becomes the veterinarian's job to determine the possible roles of disease, injury, conformation, training, genetics, and other factors including the owner's expectations that may or may not be reasonable for that particular horse. The authors have assembled an outline of things to consider when evaluating a horse for poor performance.

What should be considered in a performance evaluation?

A physical examination of the horse is the first step, and is done to rule out disease. The examination should include a lameness evaluation and routine bloodwork. The authors state that obvious disease per se is not often found in a performance evaluation because owners can generally detect signs of illness or lameness that are serious enough to affect the horse's ability to perform. More subtle disease signs that may not have been noticed by the owner can be found by a veterinarian.

As important as the physical exam is a determination as to whether the horse is truly underperforming. The practitioner should ask questions about the horse's breeding, health history, training, past performance, and rider's skill level as well as the expectation the owner has for the horse. If it seems likely that one or more of these factors accounts for the perceived lack of performance, the owner and veterinarian can discuss whether or not changes can be made to improve performance. For example, further training of the horse and/or rider may be quite helpful. On the other hand, if the horse's conformation makes it very difficult or even impossible for him to execute a particular movement required in upper-level dressage, it is unrealistic to expect that any amount of training will improve the horse's dressage scores for this movement.

Another important element is some sort of exercise test in which the musculoskeletal, cardiovascular, and respiratory systems are carefully evaluated for possible problems. In the opinion of the authors, musculoskeletal disease is the most common cause of poor performance, especially in Thoroughbred horses where subclinical myositis (muscular pain or discomfort) is frequently found. Muscle enzymes should be compared before and after an exercise test, as large variations may point to a problem. Muscle biopsies can aid in the diagnosis of diseases such as polysaccharide storage myopathy (PSSM) or hyperkalemic periodic paralysis (HYPP). Flexion tests may uncover pain or stiffness in the horse's joints.

Examination of the cardiovascular system before, during, and after exercise may reveal factors leading to poor performance. Resting heart rate and the time required for the pulse to return to base level following exercise may

provide an indication of fitness. Auscultation (listening to the heart) before and after exercise is advised. Use of an EKG during exercise will aid in a complete evaluation of the horse's cardiovascular system.

The authors state that problems in the respiratory system are common factors in poor performance. Tests of the horse in a resting state should include endoscopic examination of the respiratory tract with transtracheal aspiration and bronchoalveolar lavage used to evaluate pathogens and cells within the tract. Even in horses being evaluated for poor performance, these tests often do not reveal the cause of the problem, and exercise testing may provide more information. Videoendoscopy can be performed while a horse is exercising on a treadmill, and slow-motion viewing of the recording may show a defect or obstruction. Measurements of upper airway flow mechanics can also be helpful in making a diagnosis.

To make a treadmill exercise test as meaningful as possible, horses need to become accustomed to running on the treadmill and should if possible be tested while they are wearing the tack or harness used in their performance discipline. Tongue ties, bits, overchecks, nosebands, and side reins should be used during the test if they are commonly used during exercise, as they may affect the horse's headset and/or airflow during performance.

The authors report on surveys in which about 300 horses were presented for poor performance and were examined during treadmill exercise tests. Only about half the horses suspected of upper airway obstruction after a resting examination showed signs of obstruction when examined endoscopically during exercise. The most commonly diagnosed upper airway obstruction in these surveys was intermittent dorsal displacement of the soft palate, while laryngeal hemiplegia was the second most common finding. Several other problems (epiglottic entrapment, dynamic pharyngeal collapse, and epiglottic retroversion) not commonly seen at rest were detected videoendoscopically during treadmill exercise. It was noted that horses found to have upper airway obstructions commonly had a history of abnormal respiratory noise during exercise.

In this report, the authors make the interesting observation that horses performing maximal exercise (and therefore using up a lot of oxygen) will show high levels of carbon dioxide and low levels of oxygen in the blood, and these findings will also be true for horses with lung disease. Therefore, according to the report, "It is impossible to distinguish between good athletes and horses with lung disease when evaluating blood gases during exercise."

Because upper airway obstructions are often seen as important factors in limiting performance, the authors suggest that these points be considered in an examination of the airway:

- Finding a condition like laryngeal hemiplegia is not always an indication that surgery should be performed. Many horses tolerate some obstruction if extreme speed is not an issue.
- Upper airway abnormalities that are not accompanied by noise may not be significant enough to require correction.
- Horses that work at high speed for further than half a mile are often hampered by upper airway obstructions and might benefit from surgical correction, while horses working more slowly or for shorter distances may not actually be limited by an obstruction even if they exhibit noisy respiration.
- Repeated surgeries on upper airway obstructions greatly increase the chance of serious complications, according to the authors, and often very little benefit is gained by a second or third surgery.

The full text of this paper can be found in the Proceedings of the Twenty-third Bain-Fallon Memorial Lectures (2001), pp. 69-72.

For more information on performance and airway problems, see these Equine Review articles: Science Update 26, and Health Line 03, 12, 29, and 32.