



Helping Horses with Heaves

by: Nancy S. Loving, DVM

September 01 2007 Article # 10472

Heaves is the equine equivalent to human asthma, with owner management as the key to preventing future episodes.

If a horse can't breathe, he can't work. Unimpeded respiration is needed to supply working muscles with oxygen to fuel locomotion. While respiratory problems range from infectious to allergic, anything that affects the lower airway has a tremendous impact on performance. One common lower airway problem in horses that has been recognized for centuries is heaves.

What is Heaves?

Laurent Cou  til, DVM, Dipl. ACVIM, associate professor of large animal medicine and director of the Equine Sports Medicine Center at Purdue University's School of Veterinary Medicine, is an expert in equine pulmonology--the study of the anatomy, physiology, and pathology of the equine lungs. He describes how inflammatory airway conditions are viewed in today's horse world: "The terms heaves and recurrent airway obstruction (RAO) refer to horses with overt increased respiratory efforts at rest that can be reversed by administration of bronchodilators, corticosteroids, or a changes in the horse's environment such as avoiding exposure to offending allergens like dust and molds from hay. The term inflammatory airway disease (IAD) is used to describe horses with more subtle clinical signs such as poor performance, exercise intolerance, or coughing, with occasional excess respiratory mucus. Horses with IAD do not display any obvious increased respiratory effort at rest or signs of infection, such as fever or changes in blood counts."

A horse with heaves (generally referred to in scientific literature as RAO) displays distinct signs that alert an owner to a problem. Cou  til notes the most common clinical signs reported by owners of horses with RAO are exercise intolerance, coughing, and increased breathing efforts such as nostril flare and abdominal efforts to breathe. He says that clear to mucopurulent (containing mucus and pus) nasal discharge is also reported in association with these conditions, but less frequently.

Cou  til explains the events that occur with RAO that lead to these clinical signs: "Inhaled particles or irritants are deposited in the small airways in the lungs, which triggers a series of signals leading to airway inflammation. Cells (such as macrophages) that line the airways respond by trying to engulf the particles, and other specialized cells increase production of mucus. More inflammatory cells, in particular, neutrophils, migrate from the blood toward the airways in the lower lung."

Then, he notes, "Inflammatory byproducts thicken the walls of these airways and elicit constriction of the air tubes. These modifications cause widespread airway obstruction in the deep lung areas, forcing the horse to increase his breathing efforts in order to be able to move air in and out of the lungs. I often use the analogy of an inflated rubber balloon that you need to squeeze hard to deflate if its neck is pinched."

A horse that has endured heaves long-term has had to make extreme efforts to aerate his lungs, and this requires extra work from the breathing muscles. A result of this is a visible "heave line" in the flank area. Cou  til says the heave line is due to the bulge in the hypertrophied (excessively developed) external abdominal oblique muscles in the abdominal wall. These muscles are particularly visible during expiration because muscle contraction helps compress the lungs in late exhalation.

Prevention and Control

Cou  til stresses the role environment has on airway reactivity in triggering episodes of heaves in RAO-susceptible horses. He urges owners to concentrate on managing the environment for prevention and control of heaves. "Prevention should be focused on decreasing levels of airborne particles and irritants, referred to as 'respirable particles,' that may reach deep in the lungs when horses breathe," he says. "Most respirable particles are mold spores that originate from feedstuff and bedding materials, such as hay and straw. Other irritants that trigger heaves are endotoxins (potentially toxic compounds found inside pathogens such as bacteria; they are released mainly when bacteria are lysed) and ammonia, which are particularly abundant in soiled bedding."

He maintains that there are two ways to decrease particle levels in the stable: 1) Use feedstuffs and bedding that generate low levels of respirable dust, and 2) Improve ventilation in the stable to enhance dust removal. Cou  til notes, "Choosing low-dust feed (e.g., complete feed pellets) and bedding (e.g., wood chips or shredded paper) will significantly cut dust levels in the barn, potentially by as much as 97%."

In addition, air circulation within the stable plays an important role in respiratory health. He says, "Proper building design is needed to ensure adequate ventilation."

More often than not, it is best to house an RAO-susceptible horse outside. Cou  til suggests, "The ideal environment for most RAO-susceptible horses is grass pasture, because outdoor dust levels are usually markedly lower than in stables. However, some horses develop signs of heaves while on pasture during the summer, due to airborne pollen and outdoor molds. Those horses benefit from being housed in a barn, but dust levels indoors should be kept to a minimum as discussed above."

Cou  til says these "summer heaves" horses are different from the classic RAO horses because they improve during the winter while being housed in a barn, yet they get worse during the grazing season. "However," he says, "a small percentage of RAO horses may be affected by both conditions." He recommends that it is best to examine all elements of the environment, and he gives cautionary advice: "Feeding hay, and, in particular, from round bales, is the worst in stimulating a heaves episode. I have seen many horses kept on pasture 24/7 that showed severe clinical signs as long as they had continued access to round bales, which tend to grow mold and collect dust. The vast majority of these horses improved within two weeks of removing the round bales from the pasture."

Airway Assessment

Clinical signs are an important element in determining if a horse is affected with RAO or some other respiratory disease. Cou  til stresses the importance of a

thorough clinical exam, complete with careful listening to the lung fields with a stethoscope (auscultation).

"With auscultation, detection of an enlarged area on both sides of the chest that is consistent with lung overinflation is strongly suggestive of heaves," he explains. "In such cases, lung sounds are heard well beyond the usual boundaries of the lungs, and these are abnormal sounds like harshness, crackles, and wheezes. However, auscultation is not a sensitive tool and allows detection only of advanced cases."

Some people skin test horses for allergies that they think could cause respiratory problems, but Couëttil reports, "Such skin testing has demonstrated that healthy horses respond to similar antigens (substances capable of inducing specific immune responses in the body, by binding to specific antibodies) as RAO-affected horses do, and there is no correlation (of allergen) with inhaled antigen challenge. No data are available for allergen testing based on blood samples."

Couëttil says the gold standard for diagnosing RAO is based on lung function testing showing immediate (i.e., within five to 10 minutes) improvement after administration of an inhaled bronchodilator such as albuterol. He laments, "Unfortunately, only a handful of veterinary hospitals are equipped to conduct those tests."

Other diagnostic measures are useful to identify the presence of lung pathology, but they are not necessarily specific for heaves. Couëttil explains, "Endoscopy reveals excessive mucopus in the tracheas of most RAO horses, but not in all cases. Also, excess mucus is not specific for RAO, but can be found in a variety of inflammatory lung conditions, including IAD. Thoracic radiographs are not useful for diagnosing RAO because they are poorly sensitive and not specific for the disease. The most useful diagnostic tool, besides lung function testing, is cytological (cellular) analysis of respiratory secretions, in particular, those obtained via bronchoalveolar lavage." In this process the veterinarian "washes" a part of the lung with fluid and collects the fluid for analysis.

A new device called Open Pleth (manufactured by Ambulatory Monitoring) can be used to test lung function in the field. Couëttil is optimistic about the information that can be gained and hopes veterinarians will take advantage of the opportunity to diagnose heaves in the field.

Couëttil says a recent Swiss study revealed that some bloodlines have an increased susceptibility to the disease, particularly some Warmblood lines. The study (Ramseyer et al., "Effects of genetic and environmental factors on chronic lower airway disease in horses," *Journal of Veterinary Internal Medicine*, Vol. 21:1, 149-156, 2007) showed that offspring from RAO-affected stallions are four to six times more likely to show clinical signs consistent with RAO than are maternal half-siblings.

By recognizing in advance those horses at a higher risk for heaves, veterinarians can advise owners about implementing environmental control measures early in a horse's life. Couëttil is hopeful this might help prevent the condition. "Hopefully, we will have screening tests in the near future that will allow testing of the susceptibility of a horse to this respiratory disease," he says.

Heaves Treatment

For treatment protocols, Couëttil urges that controlling the horse's environment is first and foremost. "Strict environmental control measures are aimed at decreasing airborne dust mainly by removing hay from the diet and implementing pasture turnout," he states. "If an owner would like to return the horse to athletic activities very quickly, then I recommend medical therapy with bronchodilators and corticosteroids, preferably using aerosol treatment.

"Aerosol delivery devices are useful to speed recovery or for horses that do not respond appropriately to environmental measures," Couëttil adds. "The main limitation is the cost of those devices and associated inhalers. The most effective steroids are fluticasone and beclomethasone given twice a day. Usually, it is best to administer a bronchodilator immediately before the inhaled corticosteroid to improve deposition of the medication in the lungs for full effect. The bronchodilator I find most useful is a combination of short-acting albuterol along with ipratropium bromide, which is longer-acting. This allows for twice-a-day treatment with successful results."

The current effective method of administering aerosol medication involves using metered-dose inhaler (MDI) medications given through a mask fitted over the horse's muzzle. Couëttil foresees new equine equipment on the horizon: "The maker of AeroMask (Trudell Medical International) is working on a new, smaller, and less-expensive mask. The other commercially available device is the Equine Haler (Jorgensen Laboratories)."

Many horses learn that when the mask is placed over the muzzle for treatment, they become more comfortable, and there is a positive association with the treatment, hence, full cooperation. Couëttil says, "I have successfully administered inhaled drugs directly at the nostrils in horses with severe heaves, however as soon as a horse's breathing improves, it usually doesn't accept this method of administration. Evidently, the puff delivered in the nostril causes an unpleasant sensation."

In decades past, it was common for practitioners to give oral or injectable antihistamines to treat airway problems in horses, but improved pharmacological information sheds some doubt on consistent efficacy in this application. Although histamines are involved in the inflammatory cycle within the lungs in a case of heaves, Couëttil notes, "In my experience, I have found antihistamine therapy to be unpredictable and unreliable. Some horses appear to benefit from it, while others do not. However, most reports are anecdotal; I am not aware of any controlled studies that have examined efficacy of this medication."

Take-Home Message

Limiting the presence of environmental irritants is essential in preventing and managing a horse with heaves, so all measures should be taken to keep a horse's airways functioning as efficiently as possible so he can perform to his utmost potential.



Readers are cautioned to seek the advice of a qualified veterinarian before proceeding with any diagnosis, treatment, or therapy.

Copyright © 2010 BLOOD-HORSE PUBLICATIONS. All rights reserved. Reproduction in whole or in part in any form or medium without written permission of BLOOD-HORSE PUBLICATIONS is prohibited. THE HORSE, THE HORSE logo, THEHORSE.COM and THEHORSE.COM logo are trademarks of BLOOD-HORSE PUBLICATIONS.