Recurrent Airway Obstruction (RAO) in the Horse

A PowerPage Presented By

Recurrent airway obstruction (RAO) is a relatively common lower respiratory disease in the middle-aged to older horse. Other names associated with RAO include heaves, chronic obstructive pulmonary disease (COPD), broken wind and hay sickness. Once a horse is diagnosed with RAO, it is not cured, but rather, strategies to control the disease are implemented. This would include efforts to decrease exposure to antigens and possibly administration of immunosuppressive medications. This PowerPage will review the pathophysiology of RAO as well as the treatments to control the disease.

Key Points

- Clinical signs of RAO include increased respiratory rate and effort (**especially expiratory effort**), cough, exercise intolerance, weight loss, and potentially the development of a **heave line** (hypertrophy of the external abdominal oblique muscles)
- A variety of inciting causes such as molds and dusts in the environment result in airway hypersensitivity
- The disease is characterized by **bronchoconstriction and accumulation of mucus and neutrophils** within the airways
- Treatment may involve a combination of reducing environmental antigens, treatment of mucous/neutrophil accumulation with steroids, and bronchodilation

Pathogenesis

- The exact pathogenesis of RAO is under debate, but the disease may arise from hypersensitivity to environmental antigens such as dusts, molds or fungi within the environment
- Upon exposure to these antigens, bronchoconstriction of the small airways occurs as well as accumulation of neutrophils within the airways resulting in compromise of oxygen exchange
- The disease affects older horses (>7-8 years of age) and is classically associated with horses that are **stalled in a barn** during the winter months and/or horses being fed hay, although RAO may occur any time of the year

Clinical Signs

- Increased respiratory effort characterized especially by **exaggerated end-expiratory effort**
- If the disease is chronic, this can result in a hypertrophy of the external abdominal oblique muscles (heave line)
- Other clinical signs include:
    - Cough
    - Exercise intolerance
    - Occasionally production of a mucopurulent nasal discharge
- With chronicity, weight loss may become apparent. Wheezes and crackles are frequently heard on auscultation of the thorax

Diagnosis

- Presumptive diagnosis is based on:

  - Signalment (horses > 7-8 years of age)
  - Evidence of contributing environmental factors and compatible clinical signs
  - Thoracic auscultation
- Supportive evidence includes increased numbers of neutrophils within bronchoalveolar lavage (BAL) fluid; in healthy horses, BAL fluid primarily consists of macrophages
- **Curshmann's spirals**, which are inspissated mucus plugs, may also be visible on cytology and are suggestive of RAO
- Typically, radiographs of the thorax are not helpful in establishing a diagnosis of RAO in the horse
- The CBC and biochemistry profile are relatively normal but significant hypoxemia may be demonstrated upon examination of arterial blood gas results
- Potential identification of causative antigens has been investigated with serum or intradermal skin tests
  - However, results of these "allergy" tests have revealed inconclusive results

Treatment

Treatment is approached from two aspects, environmental control followed by medications that help control the inflammation and bronchoconstriction of the airways

- Some horses with RAO simply need **fresh air and a decreased exposure to antigens**. Discontinue stabling the horse in a stall (if housed inside for any length of time) if possible
  - If the horse must be stalled, do not bed the horse's stall with shavings or straw while the horse is in the stall
    - Wet down the bedding lightly if bedding is associated with clinical signs
    - Do not store hay above the horse's stall
  - Wet down/soak the hay
  - Consider a pelleted diet or alfalfa cubes or pellets

- If environmental changes are not enough to eliminate the clinical signs of RAO consider administration of corticosteroids and/or bronchodilators. These medications can be administered in a variety of ways including orally, parenterally, and aerosolized
  - Corticosteroids such as dexamethasone and prednisolone can be used in acute episodes to decrease inflammation
  - Bronchodilators such as clenbuterol and albuterol can be used to help with bronchoconstriction

Prognosis

Typically, horses are not cured of RAO but can be managed through the aforementioned treatment modalities. Ideally, environmental changes are enough to control the disease, but often times other medications are necessary. With appropriate care, the prognosis for RAO is good although the owner must be willing to monitor and treat the horse routinely.