

EVALUATION OF A TREATMENT PROTOCOL FOR SEVERE EQUINE ASTHMA IN SPORT HORSES: A CLINICAL EXPERIENCE

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Abstract

Severe Equine Asthma (RAO - Recurrent Airway Obstruction) is a chronic respiratory condition commonly encountered in sports horses, significantly affecting athletic performance. This case study evaluates the effectiveness of a complex therapeutic protocol applied to a sports horse diagnosed with severe equine asthma. The protocol included pharmacological therapy (anti-inflammatory drugs, mucolytics, and nebulisations with bronchodilator medications), strict environmental management to reduce allergen exposure, and detailed monitoring of clinical progress. The results indicated a significant improvement in respiratory clinical parameters, a reduction in airway inflammation, demonstrated by the cytological analysis of bronchoalveolar lavage, and a considerable improvement in the cytological profile, leading to a gradual recovery of the horse's exercise capacity. This case highlights the importance of individualized treatment and strict environmental management in optimizing the health of horses diagnosed with severe equine asthma. The study provides valuable information for developing effective therapeutic protocols in current veterinary practice.

Key words: equine asthma, RAO, environmental management, therapeutic protocol, sport horse.

INTRODUCTION

Respiratory health is a critical factor in equine performance, particularly in sport horses, where even minor impairments can significantly impact athletic ability. Among the most common chronic respiratory conditions affecting horses is Severe Equine Asthma (SEA), previously known as Recurrent Airway Obstruction (RAO).

This condition is characterized by airway inflammation, mucus accumulation, and bronchoconstriction, leading to exercise intolerance, chronic coughing, and respiratory distress.

Effective management of Severe Equine Asthma requires a comprehensive approach, combining pharmacological therapy, environmental modifications, and long-term monitoring to control symptoms and maintain performance.

This article presents a case study of a sport horse diagnosed with SEA, evaluating the effectiveness of a multimodal therapeutic protocol, including anti-inflammatory treatments, nebulization, and strict environmental management. By analysing clinical progress and treatment outcomes, this study highlights key strategies for optimizing

respiratory health in affected horses (Ivester et al., 2018).

MATERIALS AND METHODS

The evaluation began with a review of the horse's medical history and anamnesis, focusing on previous respiratory issues, environmental conditions, and past treatments.

This was followed by a comprehensive clinical examination, including auscultation, respiratory rate assessment, and evaluation of nasal discharge and coughing. To further investigate the condition, an endoscopy of the respiratory tract was performed to visualize mucus accumulation and airway hyperreactivity.

Additionally, lung ultrasonography was used to detect pulmonary changes, while cytological analysis of bronchoalveolar lavage (BAL) provided crucial information on airway inflammation and cellular composition.

RESULTS AND DISCUSSIONS

Patient history and signalment

The affected horse, a 13-year-old castrated male Oldenburg sport horse, presented with clinical signs including coughing, nasal discharge, and

increased respiratory effort, which affected his endurance and performance in show jumping competitions.

Clinical Examination and Diagnostic Work-Up

The first clinical evaluation of the patient was performed on 09.04.2024. During the examination, the horse's vital parameters were within normal limits, but it presented with coughing, laboured breathing, and mucopurulent nasal discharge. Lung fields appeared normal, though subcrepitant rales were detected upon auscultation.

Ultrasonographic examination revealed no significant pleural abnormalities. An endoscopic examination of the respiratory tract showed moderate tracheal changes, with abundant purulent mucus and mild inflammation at the tracheal bifurcation.

Samples from the tracheal and bronchoalveolar lavage were collected for cytological examination, which was performed by a specialized laboratory.

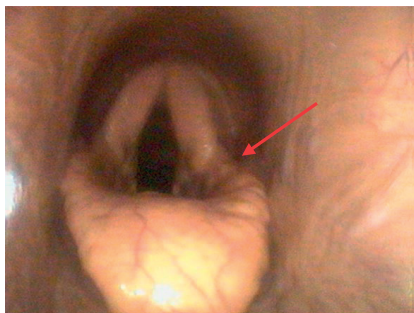


Figure 1. The endoscopic image reveals a moderate inflammatory process affecting the epiglottitis

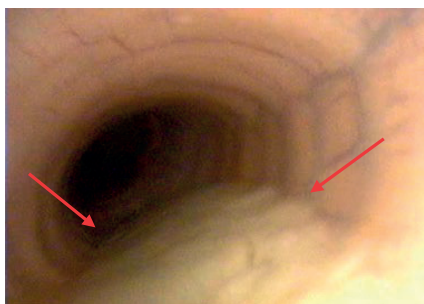


Figure 2. The red arrows indicate the amount of mucus present in the trachea

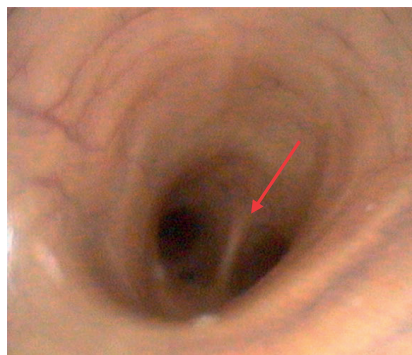


Figure 3. The red arrow indicates moderate inflammation at the carina of the trachea

Cytology & Bacteriology Results

Cytology

Smears reveal an abundant inflammatory population, predominantly composed of moderately to mildly degenerated neutrophils. This indicates a marked neutrophilic inflammation, which may be associated with either an infectious process (bacterial, fungal, parasitic, or other causes) or a non-infectious condition, such as severe equine asthma. In this case, the high proportion of neutrophils, along with the presence of suspect bacterial forms, increases the suspicion of a septic process.

According to scoring system for tracheal mucus: accumulation, localisation, apparent mucus-apparent viscosity and colour, our case is grade 4.

Bacteriology

Aerobic bacteria were identified and found to be sensitive to sulfadoxine-trimethoprim and doxycycline.

Treatment Procedure

The treatment protocol for severe equine asthma involved a multimodal approach to address airway inflammation, mucus accumulation, and bacterial infection.

Inhalation therapy was a key component, with Serroflo 25/250 administered via a Babyhaler inhalation device. The dosage was gradually reduced over three weeks, ensuring effective bronchodilation and anti-inflammatory action.

To manage the suspected bacterial infection, a combination of Borgal (IV/IM) and doxycycline powder was prescribed. Doxycycline was given orally or mixed with feed, depending on the horse's feeding behaviour.

Table 1. The table outlines the treatment protocol implemented based on the laboratory results, focusing on reducing airway inflammation, controlling infection, and improving respiratory function

Category	Medication	Dosage & Administration	Duration
Inhalation Therapy	Salmeterol 25 µg + Fluticasone Propionate 250 µg (Serflo 25/250)	Salmeterol 200 µg+ proprionat de fluticazonă 2000 µg/ 8 puffs per nostril, 2×/day (2 weeks) → 4 puffs 2×/day (4 days) → 2 puffs 2×/day (3 days)	3 weeks
	Trimethoprim and sulfadoxin	15 mg/kg IV/IM, SID	5 days
Antibiotics	Doxycycline powder	10 mg/kg PO BID (mixed in feed or orally if needed)	10 days
	Bromhexine powder	50 mg/kg PO SID	10 days
Corticosteroids	Prednisolone acetate Dexamethasone 7.50 mg/ml 2.50 mg/ml	75 mg/horse+25 mg/horse, IM, 1×/week	4 weeks
	Flumethasone	0.003 mg/kg IM, 1x/week	4 weeks

For mucus clearance, Bromhexine powder was included in the treatment plan to enhance airway function. Additionally, supportive therapy with Depedin Veyx was administered once weekly to strengthen the immune system and overall recovery. To further control airway inflammation, Flumethasone, a corticosteroid, was given weekly via intramuscular injection to help reduce clinical signs and improve respiratory function. This comprehensive treatment strategy aimed to achieve long-term respiratory relief while ensuring the horse could maintain its athletic performance. In addition to medical treatment, environmental modifications were implemented to minimize allergen exposure and support respiratory health. The horse was kept on dust-free bedding, and stable ventilation was improved to reduce airborne irritants. To further decrease respiratory triggers, the horse was fed high-quality hay, which was either soaked or steamed to eliminate dust and mold spores. These measures played a crucial role in managing severe equine asthma and preventing symptom recurrence.

RESULTS AND DISCUSSIONS

The treatment protocol, combining pharmacological therapy and environmental modifications, significantly improved the horse’s respiratory condition. Clinical signs such as coughing, nasal discharge, and increased respiratory effort were notably reduced throughout treatment. Bronchoalveolar lavage (BAL) cytology showed a marked decrease in neutrophilic inflammation, supporting the effectiveness of the anti-inflammatory and antibiotic therapy. The reduction in purulent mucus, observed via follow-up endoscopy, further confirmed treatment success. Additionally, improvements in airway function and exercise tolerance were noted, allowing the horse to gradually return to training.

Environmental management plays a crucial role in maintaining respiratory health. The use of dust-free bedding, improved ventilation, and soaked or steamed hay minimized allergen exposure, preventing symptom recurrence. This case highlights the importance of a multimodal approach in managing severe equine asthma, emphasizing the need for individualized treatment, regular monitoring, and strict environmental control to optimize respiratory function and athletic performance. After completing the treatment, the patient was re-evaluated on 30.10.2024. During the clinical examination, vital parameters remained within normal limits, respiratory sounds were unchanged, and no nasal mucus was present.

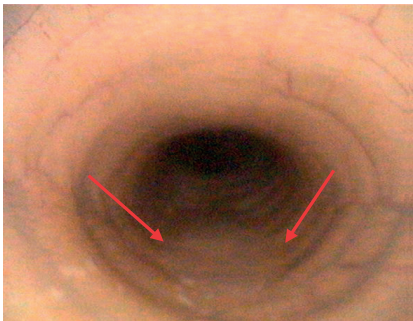


Figure 4. The red arrows indicate a decreased amount of mucus in the trachea following treatment

The horse exhibited only a mild dry cough, and a significant improvement was observed during the endoscopic examination. A very small

amount of mucus was detected in the trachea, with no signs of inflammation in the upper or lower airways.

The cytological examination of tracheal aspirate (TA) and bronchoalveolar lavage (BAL) after treatment showed notable improvement, though some signs of inflammation persisted. In TA, moderate neutrophilic inflammation (73% neutrophils) was still present, along with macrophages and lymphocytes, but no infectious agents were detected. BAL results showed a lower inflammatory cell count, with activated macrophages (74%), a moderate proportion of neutrophils (11%), and lymphocytes (15%), indicating a reduction in airway inflammation. While no pathogens were identified, their presence could not be entirely ruled out. These findings suggest a positive response to treatment, with a significant decrease in neutrophilic inflammation, though mild residual inflammation remains, consistent with mild to moderate equine asthma.

Over the next two weeks, the patient continued a mild maintenance treatment to support recovery and prevent relapse. The horse received Depedin (10 mL IM) and Vecort (4 mL IM) as part of the supportive therapy. Additionally, inhalation therapy was maintained with 8 puffs in the morning and evening daily for two weeks. This follow-up treatment aimed to stabilize respiratory function, sustain the positive response to therapy, and prevent inflammation recurrence.

Long-term environmental management is essential for controlling severe equine asthma and preventing recurrence. To minimize allergen exposure, dry hay should be avoided, with Haygain steaming or soaking for at least 20 minutes recommended to reduce dust and mold. Proper stable ventilation helps decrease airborne irritants, while dust-free bedding such as wood shavings or paper is preferred over straw unless it is of high quality and dust-free. Regular pasture turnout or paddock time is beneficial, but for sensitive to pollen horses, exposure should be adjusted based on seasonal triggers. Training should be conducted in well-ventilated areas, avoiding dusty arenas that could worsen respiratory symptoms. Additionally, routine veterinary monitoring, including bronchoalveolar lavage (BAL) cytology and clinical assessments, is crucial for tracking

disease progression and adjusting management strategies. By maintaining these long-term modifications, the horse's respiratory health and athletic performance can be optimized while minimizing the risk of asthma flare-ups.

CONCLUSIONS

This article highlights effective treatment strategies for managing severe equine asthma, emphasizing the importance of a multimodal approach combining pharmacological therapy, inhalation treatments, and environmental management. The significant clinical improvement observed in this case underscores the vital role of allergen control in maintaining long-term respiratory health.

Early diagnosis of equine asthma is crucial for preventing disease progression and preserving respiratory function. The use of advanced imaging techniques such as lung ultrasound and endoscopy, combined with laboratory tests like bronchoalveolar lavage (BAL) cytology and biomarker analysis, allows for a more accurate assessment of airway inflammation and helps tailor individualized treatment plans.

Future research should focus on refining diagnostic methods, developing novel therapeutic approaches, and optimizing environmental management strategies to further enhance equine respiratory care and athletic performance.

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