Review of the Diagnosis, Treatment, and Management of Equine Multinodular Pulmonary Fibrosis (Five Cases)

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Equine multinodular pulmonary fibrosis is a severe form of interstitial fibrosis and was recently discovered to be associated with the equine gammaherpes virus, equine herpesvirus type 5. Early diagnosis and appropriate therapeutic management of this condition is critical for a successful outcome. Author’s address: Mid-Atlantic Equine Medical Center, 40 Frontage Road, Ringoes, New Jersey 08551; e-mail: rbelgrave@yahoo.com. © 2009 AAEP.

1. Introduction

Interstitial lung disease has historically been a poorly understood phenomenon in horses, primarily because of the inability to identify a causative agent. It is characterized by damage to the pulmonary interstitium, including the alveolar epithelium, capillary endothelium, basement membrane, and perivascular and perilymphatic tissues. This results in functional loss of alveolar-capillary barrier.¹

Equine multinodular pulmonary fibrosis (EMPF) is a recently described form of interstitial pneumonia.² Equine herpesvirus 5 (EHV 5) of the equine gammaherpes virus subfamily has been implicated in the development of this condition in horses.² Researchers evaluated the gross pathologic, histopathologic, and virologic findings of 24 horses with nodular fibrotic lung disease. They compared their findings with 23 age-matched controls, and they were able to detect the DNA of equine herpesvirus 5 through polymerase chain reaction (PCR) testing of affected lung tissue.²

The clinical findings, diagnosis, treatment, and outcome of five horses diagnosed with EMPF have been described³ as well as a single case report describing the association of EMPF with profound pancytopenia.⁴ The purpose of this review is to describe the diagnosis, treatment, and outcome of five horses diagnosed with EMPF to enable veterinarians in obtaining an early diagnosis of the condition.

2. Materials and Methods

Medical records of five horses diagnosed with pulmonary fibrosis based on histopathological analysis of lung-biopsy specimens were evaluated. Confirmation of the presence of EHV 5 was made with the use of PCR analysis of either bronchoalveolar lavage fluid (BALF), transtracheal wash (TTW), or lung tissue obtained by percutaneous lung biopsy or at post-mortem.

3. Results

All horses were referred with primary complaints of fever and weight loss. All horses were treated with antibiotic therapy without improvement in their
clinical condition before referral. There was no age, breed, or sex predilection. Initial clinical findings included fever, tachycardia, tachypnea, increased abdominal component to expiration, diminished bronchovesicular lung sounds, cough, nasal discharge, epistaxis, and poor body condition. Blood work typically reflected a systemic inflammatory response characterized by either a neutrophilic leukocytosis and/or hyperfibrinogenemia. A reduced albumin:globulin ratio supportive of a chronic inflammatory process was also noted. Anemia was also noted in three of five horses. Endoscopic evaluation of the lower respiratory tract revealed varying degrees of mucopus in the trachea that were concentrated at the level of the thoracic inlet. Thoracic ultrasonographic findings varied and included diffuse pleural roughening, severe cranioventral lung consolidation, and the more characteristic discreet superficial pulmonary nodular lesions (Fig. 1).

Radiographic evaluation revealed the presence of a severe nodular interstitial pattern (Figs. 2 and 3). Transtracheal washes were performed and revealed the presence of an inflammatory exudate. Bacterial cultures yielded growth in four of five horses. An unidentified fungal organism was cultured in one case. Bronchoalveolar lavage was performed in one of five cases on admission, and it revealed inflammation of the lower respiratory tract. PCR testing for EHV 5 in this sample was positive. PCR testing for EHV 5 on bronchoalveolar lavage fluid in two horses after treatment with antiviral therapy was negative. Ultrasound-guided percutaneous lung biopsies were performed on all five cases. In all cases, a diagnosis of severe pulmonary fibrosis was
made. Intranuclear inclusion bodies were noted in two of five biopsy samples. PCR testing for EHV 5 was performed on three biopsy specimens. All were positive. PCR testing for EHV 5 on post-mortem lung tissue samples was performed in two horses. Both were positive.

Treatment included broad-spectrum antibiotics (5 of 5), corticosteroid therapy (4 of 5), antifungal therapy (1 of 5), and antiviral therapy (3 of 5) with acyclovir or valacyclovir. Two of five horses survived to return to previous performance levels with no evidence of exercise intolerance. Two of three horses treated with antiviral therapy survived. The duration of the antiviral treatment in these two horses was 111 and 77 days. Follow-up chest radiographs in surviving horses revealed a residual bronchointerstitial pattern post-treatment (Figs. 4 and 5).

4. Discussion
Historically, a variety of etiologic agents have been postulated to be involved in the development of interstitial lung disease. EMPF is a severe progressive debilitating form of interstitial pneumonia shown to be associated with the presence of EHV 5. Early diagnosis and treatment with antiviral therapy is critical for a successful outcome. The duration of treatment should be determined by serial ultrasonographic and radiographic examinations as well as repeat PCR testing for EHV 5 on BALF.

References

Fig. 5. Chest radiographs of the cranioventral lung field of an 8-yr-old Warmblood gelding 3-mo after initiation of treatment revealing a residual bronchointerstitial pattern.